



STIC Search Report

EIC 1700

STIC Database Tracking Number: 173151

TO: Gregg Cantelmo

Location: REM 6B71

Art Unit : QAS

December 2, 2005

Case Serial Number: 10/733385

From: Kathleen Fuller

Location: EIC 1700

REMSEN 4B28

Phone: 571/272-2505

Kathleen.Fuller@uspto.gov

Search Notes



STIC Search Results Feedback Form

EIC17000

Questions about the scope or the results of the search? Contact *the EIC searcher* or contact:

Kathleen Fuller, EIC 1700 Team Leader
571/272-2505 REMSEN 4B28

Voluntary Results Feedback Form

- I am an examiner in Workgroup: Example: 1713
- Relevant prior art **found**, search results used as follows:

- ☐ 102 rejection
- ☐ 103 rejection
- ☐ Cited as being of interest.
- ☐ Helped examiner better understand the invention.
- ☐ Helped examiner better understand the state of the art in their technology.

Types of relevant prior art found:

- ☐ Foreign Patent(s)
- ☐ Non-Patent Literature
(journal articles, conference proceedings, new product announcements etc.)

➤ Relevant prior art **not found**:

- ☐ Results verified the lack of relevant prior art (helped determine patentability).
- ☐ Results were not useful in determining patentability or understanding the invention.

Comments:

Mellerson, Kendra

113151

From: "Gregg Cantelmo" [gregg.cantelmo]
Sent: Thursday, December 01, 2005 5:41 PM
To: STIC-EIC1700
Subject: Database Search Request

Requester:
Gregg Cantelmo (TC1700)
Art Unit:
1745
Employee Number:
75777
Office Location:
REM 6B71
Phone Number:
571-272-1283
Mailbox Number:

SCIENTIFIC REFERENCE BR
Sci & Tech Inf. Cntr.

DEC 2 RECD

Pat. & T.M. Office

Case serial number:
10/733385

Class / Subclass(es):

Earliest Priority Filing Date:

Format preferred for results:

Search Topic Information:

See claims and related application 11/062597

Special Instructions and Other Comments:

=> FILE WPIX

FILE 'WPIX' ENTERED AT 12:41:02 ON 02 DEC 2005
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FILE LAST UPDATED: 30 NOV 2005 <20051130/UP>
MOST RECENT DERWENT UPDATE: 200577 <200577/DW>
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=> D QUE L58

L43 7255 SEA FILE=WPIX ABB=ON (CARRIER? OR SUPPORT?) (4A) (CARBON OR
GRAPHITE OR NANO?)
L44 1103076 SEA FILE=WPIX ABB=ON (PT OR PLATINUM OR RU OR RUTHENIUM OR
MN OR MANGANESE OR IRON OR FE OR CO OR COBALT OR NI OR NICKEL
OR RH OR RHODIUM OR PD OR PALLADIUM OR RH OR RHENIUM OR IR OR
IRIDIUM)
L45 3173 SEA FILE=WPIX ABB=ON L43 AND L44
L46 386 SEA FILE=WPIX ABB=ON L45 AND (S OR SULFUR OR P OR PHOSPHORUS
OR O OR OXYGEN OR N OR NITROGEN) (4A) CATALY?
L47 58 SEA FILE=WPIX ABB=ON L46 AND H01M?/IC
L48 2 SEA FILE=WPIX ABB=ON JP2002-360100/PRN
L49 1 SEA FILE=WPIX ABB=ON L47 AND L48
L50 2 SEA FILE=WPIX ABB=ON L47 AND COVALENT? (2A) BOND?
L51 2 SEA FILE=WPIX ABB=ON L49 OR L50
L52 19 SEA FILE=WPIX ABB=ON METAL? (2A) COVALENT? (2A) (CARBON OR C₆₀ OR
GRAPHITE? OR NANO?)
L54 3 SEA FILE=WPIX ABB=ON L52 AND (CATALYST? OR H01M?/IC)
L55 5 SEA FILE=WPIX ABB=ON L51 OR L54
L56 301 SEA FILE=WPIX ABB=ON COVALENT? (2A) BOND? AND METAL? (3A) CATALY?
L57 6 SEA FILE=WPIX ABB=ON L56 AND H01M?/IC
L58 11 SEA FILE=WPIX ABB=ON L55 OR L57

=> D L58 FULL 1-11

L58 ANSWER 1 OF 11 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN

AN 2005-245712 [26] WPIX
 DNN N2005-202341 DNC C2005-078597
 TI Proton-conductive film for fuel cells, contains metal catalyst particles supported by vicinity of acidic radical of crosslinked structure containing metal-oxygen bond coupled to acidic radical.

DC A26 A85 L03 X12 X16

PA (SEKI) SEKISUI CHEM IND CO LTD

CYC 1

PI JP 2005050700 A 20050224 (200526)* 30 H01M008-02 <--

ADT JP 2005050700 A JP 2003-282006 20030729

PRAI JP 2003-282006 20030729

IC ICM H01M008-02

ICS C08J005-22; H01B001-06; H01B013-00; H01M008-10

AB JP2005050700 A UPAB: 20050422

NOVELTY - A proton-conductive film contains metal catalyst particles supported by the vicinity of the acidic radical of a crosslinked structure containing a metal-oxygen bond coupled to the acidic radical.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are included for the following:

(1) manufacture of proton-conductive film, which involves producing a crosslinked structure, substituting by positive ion(s) containing ion of metal catalyst of the proton of the acidic radical, reducing the metal ion and precipitating the metal catalyst particles in the crosslinked structure, and forming a crosslinked structure supporting the metal catalyst particles; and

(2) fuel cell using the proton-conductive film.

USE - For fuel cells, such as polymer electrolyte fuel cells, used as power source for mobile components, vehicles, and portable apparatuses.

ADVANTAGE - The proton-conductive film enables stable fuel-cell operation over a long period to time, even at high temperature and low humidity. Leak of hydrogen is prevented, and proton conductivity is ensured. The utilization efficiency of the metal catalyst particles is improved. Reaction of hydrogen and oxygen is promoted by vicinity of metal catalyst particles, and the generated water effectively functions as a medium for proton conduction. The film has excellent dimensional stability, mechanical strength, heat resistance, durability, fracture resistance, and swelling resistance. The film provides a thermal protection system by self-humidification.

DESCRIPTION OF DRAWING(S) - The figure shows the principal portion model of the proton-conductive film.

interval 2

Dwg.1/2

TECH JP 2005050700 AUPTX: 20050422

TECHNOLOGY FOCUS - ORGANIC CHEMISTRY - Preferred Structure: The crosslinked structure is of formula (1, 2 or 3).

(X)nSi(R23-n)(R1)-SO3H (1)

Si(X)n(R3)4-n (2)

(R4)n-Si(X3-n)-R5-Si(X3-n)-(R4)n (3)

X=-O- coupling or OH group involved in crosslinking;

R1=20C or less hydrocarbon group;

R2=methyl, ethyl, propyl or phenyl;

n in formula (1)=1-3;

R3=20C or less alkyl;

n in formula (2)=2-4;

R5=1-30C atomic-containing molecular chain;

R4=methyl, ethyl, propyl, butyl or phenyl;and

n in formula (3)=0-2.

The crosslinked structure forms a continuous structure of particles, and a proton conduction path is formed at the interval (2) formed by the particles. The metal catalyst particles are supported by the surface of the particles. The three-dimensional crosslinked structure containing silicon-oxygen bond, is a structure of formula (1). The silicon atom having structure of formula (1), is 3% or more. The crosslinked structure having acidic radical contains a mercapto group. Preferred Method: An acidic-radical-containing structure is formed by sol-gel reaction. The mercapto group of the crosslinked structure is oxidized prior to substitution. A mixture of mercapto-group-containing compound having covalent-bonded hydrolysable silyl group and/or silanol group, and a polar controlling-agent is prepared. A film of continuous structure of the particles consisting of a silicon-oxygen crosslinked structure, is formed by condensing hydrolysis and condensation of mixture. The mercapto group in the film is oxidized and set as a sulfonic acid group. The sulfonic acid group is introduced to the surface of the particles. Substitution is then carried out, to obtain a crosslinked structure supporting metal catalyst particles.

ABEX JP 2005050700 AUPTX: 20050422

EXAMPLE - X41-1805 (copolymer of 3-mercapto propyl trimethoxysilane and tetraethoxysilane) (in g) (2.4), tetraethoxysilane (0.6), polyethylene glycol (0.3), triethylamine (2), and water (0.75) were dissolved in tetrahydrofuran (2.7 mL), and stirred at room temperature for 10 minutes. The mixture was allowed to stand in a Petri dish for 3 days at room temperature. The obtained film was heated under 80degreesC humidification for 12 hours. The film was immersed in water, 1N sulfuric acid, and water for 1 hour each. Unreacted substance, triethylamine and polyethylene glycol were extracted from the film. The film was dipped in a mixed solution of peracetic acid (100 ml), and heated at 80degreesC for 1 hour and 200degreesC more for 12 hours. The sheet was removed and dipped in water at 80degreesC thrice, and peracetic acid solution was completely extracted. The sheet was immersed in a platinum compound (Pt(NH3)4(OH)2) aqueous solution at room temperature for 12 hours, and ion substitution was carried out. The sheet was washed and dried, and platinum particles were precipitated. Further washing and drying were carried out to obtain a proton-conduction film with platinum supporting amount of 0.5 mg/1 cm2. A single-cell fuel cell was produced using the obtained proton-conduction film, and evaluated. The maximum-output density was 360 mW/cm2, and the limiting-current density was 1.3 A/cm2. Output reduction was not observed even at a relative humidity of 60%.

FS CPI EPI

FA AB; GI

MC CPI: A06-A00E2; A10-E22; A12-E06; L03-A02D; L03-E04A2; L03-H05
EPI: X12-D01C; X12-D01E; X16-C01C; X16-J01A

L58 ANSWER 2 OF 11 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN

AN 2005-136231 [15] WPIX

DNN N2005-116782 DNC C2005-044776

TI Catalyst layer for polymer electrolyte fuel cell electrode consists of platinum catalyst and electronic conductor of carbon black and proton conductor that is formed in agglomerate obtained from carbon black and in pore between agglomerates.

DC A85 L03 X16

PA (SEKI) SEKISUI CHEM IND CO LTD; (YAMA-N) YAMANASHI TLO KK

CYC 1

PI JP 2005032668 A 20050203 (200515)* 21 H01M004-96 <--

ADT JP 2005032668 A JP 2003-272905 20030710

PRAI JP 2003-272905 20030710

IC ICM H01M004-96

ICS H01M008-10

AB JP2005032668 A UPAB: 20050303

NOVELTY - An electrode catalyst layer consists of a platinum catalyst (3), an electronic conductor consisting of a carbon black (2), and a proton conductor. The proton conductor (4) is formed in agglomerate (1) obtained from the carbon black, and in the pore between agglomerates.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are included for the following:

(1) electrode obtained by forming the electrode catalyst layer on surface(s) of a porous material; and

(2) polymer electrolyte fuel cell obtained using the electrode.

USE - For electrode of polymer electrolyte fuel cells (both claimed).

ADVANTAGE - The electrode catalyst layer provides electrode with uniform pore distribution, and has high catalytic efficiency and electric power generation capability.

DESCRIPTION OF DRAWING(S) - The figure shows the structure of electrode catalyst layer.

agglomerate 1

carbon black 2

platinum catalyst 3

proton conductor 4

Dwg: 2/9

TECH JP 2005032668 AUPTX: 20050303

TECHNOLOGY FOCUS - INORGANIC CHEMISTRY - Preferred Properties: The pore diameter in the agglomerate is 0.08 microns or less. The pore in the agglomerate, and between the agglomerate, has diameter of 0.01-0.08 microns, and 0.08-100 microns, respectively. The integral pore volume of proton conductor is 0.2 cm³/g or more in a pore portion with a diameter of 0.01-0.08 microns, and 1.8 cm³/g or more in a pore portion with a diameter of 0.08-100 microns.

Preferred Proton Conductor: The proton conductor consists of a cross-linked-structure substance consisting of a metal oxygen bond, and acidic radical-containing structure having acidic radical coupled by the crosslinked-structure substance and covalent bond. The

proton conductor is obtained by mixing platinum-supporting carbon black and acidic radical-containing compound, and reacting hardenable material by sol-gel reaction.

TECHNOLOGY FOCUS - ORGANIC CHEMISTRY - Preferred Properties: The pore diameter in the agglomerate is 0.08 microns or less. The pore in the agglomerate, and between the agglomerate, has diameter of 0.01-0.08 microns, and 0.08-100 microns, respectively. The integral pore volume of proton conductor is 0.2 cm³/g or more in a pore portion with a diameter of 0.01-0.08 microns, and 1.8 cm³/g or more in a pore portion with a diameter of 0.08-100 microns.

Preferred Proton Conductor: The proton conductor consists of a cross-linked-structure substance consisting of a metal oxygen bond, and acidic radical-containing structure having acidic radical coupled by the crosslinked-structure substance and covalent bond. The

proton conductor is obtained by mixing platinum-supporting carbon black and acidic radical-containing compound, and reacting hardenable material by sol-gel reaction.

FS CPI EPI

FA AB; GI

MC CPI: A08-M09A; A09-A03; A12-E06; A12-E06A; L03-E04A2; L03-E04B

EPI: X16-C01; X16-E06

L58 ANSWER 3 OF 11 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN

AN 2005-127031 [14] WPIX

DNN N2005-109610 DNC C2005-042126

TI Electrode for fuel cell has cross-linked material with metal-oxygen bond formed in contact with electroconductive material, coupled in acidic radical at vicinity of which metal particles containing catalyst are precipitated.

DC L03 X16

PA (SEKI) SEKISUI CHEM IND CO LTD

CYC 1

PI JP 2005026005 A 20050127 (200514)* 31 H01M004-86 <--

ADT JP 2005026005 A JP 2003-188386 20030630

PRAI JP 2003-188386 20030630

IC ICM H01M004-86

ICS H01M004-88

AB JP2005026005 A UPAB: 20050228

NOVELTY - An electrode (100) has an electroconductive porous material (4) and a cross-linked-structure material. The cross-linked material contains a metal-oxygen bond formed in contact with the electroconductive porous material, and coupled to at least one portion in the acidic radical. Metal particles (3) containing metal catalyst are precipitated at the vicinity of the acidic radical.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are included for the following:

(a) manufacture of electrode, which involves producing a mixture of electroconductive porous material and cross-linked-structure material, substituting the proton of acidic radical by at least one type of positive ion of the metal catalyst, reducing the metal ion, precipitating the metal particles in the cross-linked-structure material, and forming a cross-linked-structure material containing metal particles; and

(b) fuel cell using the electrode.

USE - For fuel cell (claimed) useful as power supply for moving components, vehicles, and portable components.

ADVANTAGE - The electrode has excellent heat resistance, durability, dimensional stability, fuel barrier property, and economical efficiency. The utilization efficiency of metal catalyst is improved. The electrode operates steadily over a long period of time even at high temperatures, and improves the electric-power-generation efficiency of fuel cells.

DESCRIPTION OF DRAWING(S) - The figure shows the electrode.

metal particles 3

electroconductive porous material 4

electrode 100

electrolyte 200

collector 300

Dwg:1/1

TECH JP 2005026005 AUPTX: 20050228

TECHNOLOGY FOCUS - INORGANIC CHEMISTRY. - Preferred Properties: The metal particles are precipitated at the vicinity of the acidic radical positioned at the portion at which the cross-linked-structure material and electroconductive porous material touch. The cross-linked-structure material forms a continuous structure of particles, and the metal particles are precipitated at the surface of the particles. The electroconductive porous material is made water-repellent with the cross-linked-structure material consisting of a metal-oxygen bond, by sol-gel reaction.

Preferred Components: The cross-linked-structure material contains an acidic-radical-containing cross-linked-structure material of formula (1), or cross-linked-structure material of formula (2 or 3). The three-dimensional cross-linked structure has a structure of formula (1). The silicon atom in the structure of formula (1) is 3% or more with

respect to all silicon atoms in the particles. The cross-linked-structure material having acidic radical contains a mercapto group which is oxidized before ion substitution. (JP2005026005A-001.sk)

X=-O- bond or OH involved in cross-linking;

R1=20C or less hydrocarbon;

R2=methyl, ethyl, propyl or phenyl;

n in formula (1)=1-3;

R3=20C or less alkyl;

n in formula (2)=2-4;

R5=1-30C carbonized-atom-containing molecular chain;

R4=methyl, ethyl, propyl, butyl or phenyl; and

n in formula (3)=0-2.

Preferred Method: A mixture containing mercapto-group-containing compound having mercapto group and covalent-bonded hydrolysable silyl group which can carry out condensation reaction, and/or silanol and mercapto groups, and a polar controlling-agent, is prepared. A film having a continuous structure of the particles consisting of a silicon-oxygen cross-linked structure, is formed. The mercapto group in the film is oxidized, and set as a sulfonic acid group. The sulfonic acid group is introduced to the surface of the particles. At least one portion of the proton of the sulfonic acid group is substituted by the positive metal ion. The metal ion is reduced, and the metal particles are precipitated in the cross-linked-structure material to form structure containing metal particles.

TECHNOLOGY FOCUS - ORGANIC CHEMISTRY - Preferred Properties: The metal particles are precipitated at the vicinity of the acidic radical positioned at the portion at which the cross-linked-structure material and electroconductive porous material touch. The cross-linked-structure material forms a continuous structure of particles, and the metal particles are precipitated at the surface of the particles. The electroconductive porous material is made water-repellent with the cross-linked-structure material consisting of a metal-oxygen bond, by sol-gel reaction.

Preferred Components: The cross-linked-structure material contains an acidic-radical-containing cross-linked-structure material of formula (1), or cross-linked-structure material of formula (2 or 3). The three-dimensional cross-linked structure has a structure of formula (1). The silicon atom in the structure of formula (1) is 3% or more with respect to all silicon atoms in the particles. The cross-linked-structure material having acidic radical contains a mercapto group which is oxidized before ion substitution. (JP2005026005A-001.sk)

X=-O- bond or OH involved in cross-linking;

R1=20C or less hydrocarbon;

R2=methyl, ethyl, propyl or phenyl;

n in formula (1)=1-3;

R3=20C or less alkyl;

n in formula (2)=2-4;

R5=1-30C carbonized-atom-containing molecular chain;

R4=methyl, ethyl, propyl, butyl or phenyl; and

n in formula (3)=0-2.

Preferred Method: A mixture containing mercapto-group-containing compound having mercapto group and covalent-bonded hydrolysable silyl group which can carry out condensation reaction, and/or silanol and mercapto groups, and a polar controlling-agent, is prepared. A film having a continuous structure of the particles consisting of a silicon-oxygen cross-linked structure, is formed. The mercapto group in the film is oxidized, and set as a sulfonic acid group. The sulfonic acid group is introduced to the surface of the particles. At least one portion of the proton of the sulfonic acid group is substituted by the positive metal ion. The metal ion is reduced, and the metal particles are precipitated in

the cross-linked-structure material to form structure containing metal particles.

FS CPI EPI
FA AB; GI
MC CPI: L03-E04B; L03-H05
EPI: X16-E06A

L58 ANSWER 4 OF 11 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN

AN 2004-479646 [45] WPIX

CR 2005-466230 [47]

DNN N2004-378250 DNC C2004-178475

TI Catalytic material for membrane/electrode assembly used in fuel cell for hand-held electronic equipment; includes catalytic component, and catalyst carrier that contains atoms that form covalent bonds with catalytic component.

DC L03 X16

IN AONO, Y; HAYASHIBARA, M; HIDAKA, K; KAMO, T; LEE, C; SATSU, Y; SUZUKI, S; TAKAMORI, Y

PA (HITA) HITACHI LTD; (AONO-I) AONO Y; (HAYA-I) HAYASHIBARA M; (HIDA-I) HIDAKA K; (KAMO-I) KAMO T; (LEEC-I) LEE C; (SATS-I) SATSU Y; (SUZU-I) SUZUKI S; (TAKA-I) TAKAMORI Y

CYC 2

PI US 2004121221 A1 20040624 (200445)* 12 H01M004-96 <--

JP 2004207228 A 20040722 (200448) 12 H01M004-96 <--

ADT US 2004121221 A1 US 2003-733385 20031212; JP 2004207228 A JP 2003-394873 20031126

PRAI JP 2002-360100 20021212

IC ICM H01M004-96

ICS B01J021-18; B01J023-40; B01J023-74; H01M004-90;
H01M004-92; H01M008-02; H01M008-10

AB US2004121221 A UPAB: 20050725

NOVELTY - A catalytic material comprises a catalytic component and a catalyst carrier for supporting the catalytic component. The catalyst carrier contains atoms that form covalent bonds with the catalytic component.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(a) a membrane/electrode assembly comprising anodic electrode for oxidizing a fuel or a cathodic electrode for reducing oxygen having the catalytic material, and a proton-conductive material; and

(b) a fuel cell having an anodic electrode and a cathodic electrode formed via an electrolyte membrane.

The fuel cell further comprises the membrane/electrode assembly. A proton-conductive electrolyte membrane is formed between the anodic and cathodic electrodes.

USE - For membrane/electrode assembly used in fuel cell (claimed) used in hand-held electronic equipment.

ADVANTAGE -- A fuel cell with high output density can be provided using the catalytic material.

DESCRIPTION OF DRAWING(S) -- The figure is a schematic view of the carbon which includes nitrogen.

Carbon 201

Nitrogen 202

Dwg. 2/9

TECH US 2004121221 A1UPTX: 20040716

TECHNOLOGY FOCUS - INORGANIC CHEMISTRY -- Preferred Component: The catalyst carrier contains carbon (201). The catalytic component is platinum, ruthenium, manganese, iron, cobalt, nickel, rhodium,

palladium, rhenium, iridium, or their compounds.

FS CPI EPI
FA AB; GI
MC CPI: L03-E04B
EPI: X16-E06A

L58 ANSWER 5 OF 11 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN
AN 2003-450459 [43] WPIX
DNN N2003-359251 DNC C2003-119874
TI A proton conducting membrane useful for electrochemical applications, especially fuel cells without spacer groups based on a non-vinyl polymer with an aromatic ring.
DC A26 A85 L03 X16
IN LANG, F P; PALLANITS, J A; JAKOBY, K; NUNES, S P; PEINEMANN, K; PEREIRA NUNES, S; PEREIRA, S N
PA (HTPH-N) HTP HIGH TECH PLASTICS AG; (KNVS) GKSS FORSCHUNGSZENTRUM GEESTHACHT GMBH; (JAKO-I) JAKOBY K; (PEIN-I) PEINEMANN K; (PERE-I) PEREIRA S N
CYC 32
PI DE 10148131 A1 20030508 (200343)* 4 C08J005-22
AT 2002001467 A 20030515 (200343) G11B007-24
AT 411407 B 20031115 (200402) G11B007-24
EP 1420039 A1 20040519 (200434)# GE C08J005-22
R: AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI SK TR
US 2004101731 A1 20040527 (200436)# H01M008-10 <--
CA 2412310 A1 20040520 (200440)# EN H01M002-14 <--
ADT DE 10148131 A1 DE 2001-10148131 20010928; AT 2002001467 A AT 2002-1467 20020927; AT 411407 B AT 2002-1467 20020927; EP 1420039 A1 EP 2002-25250 20021112; US 2004101731 A1 US 2002-303071 20021123; CA 2412310 A1 CA 2002-2412310 20021120
FDT AT 411407 B Previous Publ. AT 2002001467
PRAI DE 2001-10148131 20010928; EP 2002-25250 20021112;
US 2002-303071 20021123; CA 2002-2412310 20021120
IC ICM C08J005-22; G11B007-24; H01M002-14; H01M008-10
ICS B01D071-68; B01D071-72; B01D071-82; C08G075-20; C08J005-20; G11B033-00; H01M008-00; H01M008-02
AB DE 10148131 A UPAB: 20030707
NOVELTY - A proton conducting membrane for electrochemical applications, especially for fuel cells, from a polymer based on a polymer with an aromatic ring but not a vinyl polymer, where the polymer with the aromatic ring has phosphonic acid groups, which are covalently bonded directly without spacer groups to the aromatic ring is new.
DETAILED DESCRIPTION - INDEPENDENT CLAIMS are included for:
(1) the polymer with the aromatic ring, which is a prepolymer with phosphonic acid groups as above; and
(2) a process for obtaining the base polymer (BP) by the steps:
(a) bromination or iodination of the BP;
(b) reaction of the halogenated BP in (a) with phosphonic and/or phosphoric acid esters in the presence of a transition metal catalyst,
(c) hydrolysis of the polymer obtained in (b) and
(d) conversion of the polymer obtained in (c) to a membrane in the form of a polymer film by a known method.
USE - The membrane is useful for fuel cells (claimed).
ADVANTAGE - The membrane obtained has improved properties, and avoids some drawbacks of previous membranes, e.g. liability to oxidation due to the use of an alkylene spacer and the high price of the materials used, e.g. fluorine containing materials.

Dwg.0/0

TECH DE 10148131 A1 UPTX: 20030707

TECHNOLOGY FOCUS - POLYMERS - Preferred Components: The BP is a polysulfone. The steps (a) to (d) above are carried out in the presence of a solvent.

ABEX DE 10148131 A1 UPTX: 20030707

EXAMPLE - A base polymer (BP) was brominated by the method described in US patent US-A 4 999 415, and had the formula, as determined by elemental analysis, C₂₄H₁₄SO₄Br₂. The degree of substitution was 200% per polymer repeating unit.

FS CPI EPI

FA AB

MC CPI: A05-J06; A10-E04A; A10-E09; A10-E20; A12-E06B; L03-E04A2
EPI: X16-C01C

L58 ANSWER 6 OF 11 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN

AN 2003-165730 [16] WPIX

CR 2001-281334 [29]; 2003-046278 [04]

DNN N2003-130859 DNC C2003-042936

TI Electrode for fuel cells, comprises heterogeneous catalyst containing electroconducting polymer unit having heteroatom(s) and several transition metal atoms covalently bonded to portion(s) of heteroatom(s).

DC A85 J04 L03 X16

IN FINKELSHTAIN, G; KATZMAN, Y; KHIKEL, M

PA (MEDI-N) MEDIS EL LTD

CYC 1

PI US 2002132157 A1 20020919 (200316)* 13 H01M004-90 <--

ADT US 2002132157 A1 US 2001-759231 20010116

PRAI US 2001-759231 20010116

IC ICM H01M004-90

ICS H01M004-92; H01M008-10

AB US2002132157 A UPAB: 20040511

NOVELTY - An electrode comprises a heterogeneous catalyst containing a highly electroconducting polymer unit having at least one heteroatom per backbone monomer unit and transition metal atoms covalently bonded to at least a portion of the heteroatom(s).

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is included for a fuel cell (20) comprising the inventive electrode.

USE - For fuel cells (claimed) for e.g. automotive propulsion systems.

ADVANTAGE - The small-sized catalytic active particles of the electrode provide high catalytic activity per unit volume. The electrode comprising the catalytic active particles is produced inexpensively. The electrode has high mechanical stability such as impact and vibration resistance. The highly electroconducting polymer matrix provides resistance to carbon monoxide poisoning of colloidal platinum particles.

DESCRIPTION OF DRAWING(S) - The figure shows schematic illustration of proton exchange membrane fuel cell.

Fuel cell 20

Anode 30

Cathode 40

Electrolyte 50

Dwg.3/6

TECH US 2002132157 A1UPTX: 20030307

TECHNOLOGY FOCUS - POLYMERS - Preferred Component: The electrode comprises an electrically conductive sheet, and a catalytic polymer film bonded to one side of the sheet. The catalytic polymer film comprises an electroconducting polymer and transition metal atoms.

Preferred Material: The polymer film comprises a polytetrafluoroethylene-

based ionomer.

The highly electroconducting polymer is selected from polyaniline, polypyrrole, polythiophene and polyfuran, preferably polyaniline.

TECHNOLOGY FOCUS - INORGANIC CHEMISTRY - Preferred Component: The conductive sheet is selected from carbon paper and carbon cloth. The electrode further comprises several particles of transition metal distributed within the polymer film. Portion(s) of the particles of transition metal atoms are nucleated and covalently bonded. The electrode further comprises several catalytically active particles embedded in film.

The fuel cell comprises an anode (30), a cathode (40), an electrolyte (50) sandwiched between the anode and the cathode. The electrolyte comprises a proton exchange membrane.

Preferred Material: The transition metal is selected from platinum, iridium, osmium, rhenium, ruthenium, rhodium, palladium, iron, cobalt, nickel, chromium, manganese, copper and vanadium, preferably platinum or iridium.

The catalytically active particles comprise carbon particles bearing colloidal catalytic metal particles on surfaces.

ABEX US 2002132157 A1UPTX: 20030307

EXAMPLE - A sample was prepared (g) in which polypyrrole powder (4.90) was suspended in distilled water (100 ml). Aqueous chloroplatinic acid (H_2PtCl_6) (0.98%) (105 ml) was added to the polypyrrole suspension over 60 minutes with constant stirring.

The resulting polypyrrole platinum chloride ($PtCl_4$) complex was separated by centrifuging and decanting. The resulting solid was rinsed with distilled water until the rinse water had a pH of 7.

A reductant solution was prepared by dissolving sodium borohydride ($NaBH_4$) (1.5) and sodium hydroxide (0.7) in distilled water (100 ml) at room temperature with stirring for 30 minutes.

The reductant solution was added to the polypyrrole $PtCl_4$ complex at 60degreesC over 2 hours. The product obtained was rinsed with distilled water until the rinse water had a pH of 7, and then was dried at 110degreesC for 24 hours to form polypyrrole-platinum catalyst (0.15).

The oxygen gas liberation rate of the catalyst per hour at room temperature under atmospheric pressure in 10% hydrogen peroxide (20 ml), was 17.3 cm³/mg of metal/hr (at room temperature and pressure).

This compares with an existing Pt/polypyrrole catalyst system (0.16) which had, under the same conditions, an oxygen release rate of 0.7 cm³/mg of metal/hr (at room temperature and pressure).

FS CPI EPI

FA AB; GI

MC CPI: A04-E08A; A04-E09; A10-E21; A12-E06A; J04-E04; L03-E04B
EPI: X16-E06A

L58 ANSWER 7 OF 11 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN

AN 2002-547308 [58] WPIX

DNN N2002-433333 DNC C2002-155070

TI Fuel cell comprises binary anode including at least one liquid fuel and at least one solid fuel.

DC L03 X16

IN BOROVSKY, G; FILANOVSKY, B; FINKELSHTAIN, G; KATZMAN, Y

PA (MORE-N) MORE ENERGY LTD; (FRIE-I) FRIEDMAN M M

CYC 96

PI US 2002076602 A1 20020620 (200258)* 14 H01M004-86 <--

WO 2002082614 A2 20021017 (200270) EN H02J000-00

RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ

NL OA PT SD SE SL SZ TR TZ UG ZM ZW

W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK

DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ
 LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD
 SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW

AU 2001297772 A1 20021021 (200433) H01M004-86 <--

ADT US 2002076602 A1 US 2000-737951 20001218; WO 2002082614 A2 WO 2001-US45758
 20011207; AU 2001297772 A1 AU 2001-297772 20011207

FDT AU 2001297772 A1 Based on WO 2002082614

PRAI US 2000-737951 20001218

IC ICM H01M004-86; H02J000-00

ICS H01M004-90; H01M008-08; H01M008-22;
 H01M012-06

AB US2002076602 A UPAB: 20020910

NOVELTY - A fuel cell comprises a binary anode (12); a cathode (14); and a liquid electrolyte between and interacting with the binary anode and the cathode. The binary anode includes at least one liquid fuel and at least one solid fuel.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are included for the following:

(a) A binary anode for a direct liquid fuel cell comprising a platinum-containing catalytic layer; a solid fuel containing a metal consisting of aluminum metal, magnesium metal, zinc metal, aluminum-magnesium alloy, zinc-magnesium alloy, aluminum-zinc alloy, or aluminum-magnesium-zinc alloy; a liquid fuel; and

(b) A method of producing current in a direct liquid fuel cell comprising providing a fuel cell; oxidizing the liquid fuel at the anode; and oxidizing the solid fuel at the anode.

USE - As fuel cell, e.g. direct methanol fuel cell (DMFC) in miniaturized form for specialized applications such as cellular phones and personal digital assistants (PDAs).

ADVANTAGE - The DMFC provides both high power parameters and excellent long-term performance. It is in miniature, portable form, such that the DMFC can be implemented in various specialized applications such as cellular phones and personal digital assistants (PDAs). Due to the binary anode, the characteristic decreasing current density of a fuel cell which 'blockage' of the electrode active surface is made temporary and reversible, such that the current output of the anode (and a corresponding fuel cell), over time, is largely unaffected.

DESCRIPTION OF DRAWING(S) - The figures are schematic cut-apart view and side view of the fuel cell.

Anode 12

Cathode 14

Dwg. 1/6

TECH US 2002076602 A1UPTX: 20020910

TECHNOLOGY FOCUS - ELECTRICAL POWER AND ENERGY - Preferred Components: The electrolyte includes an alcohol. The cathode includes catalytically active transition metal particles.

Preferred Method: H⁺ and electrons are generated at the anode, the method further comprising reacting oxygen at the cathode with the H⁺ and the electrons to produce water. Oxidizing the liquid fuel results in partial deactivation of the catalytically-active surface of the anode, and oxidizing the solid fuel results in reactivation of the catalytically-active surface. The partial deactivation is caused by carbon monoxide. The fuel cell provides cyclic supply of current. The method further comprises introducing at least the solid fuel into the fuel cell using a replaceable cartridge. The liquid fuel is introduced using the cartridge.

TECHNOLOGY FOCUS - ORGANIC CHEMISTRY - Preferred Components: The alcohol is 10-45 wt.% of the electrolyte. It is methanol. The liquid fuel includes hydrazine.

TECHNOLOGY FOCUS - INORGANIC CHEMISTRY - Preferred Materials: The solid fuel includes aluminum including aluminum powder or aluminum metal particles. It also includes magnesium or zinc.

TECHNOLOGY FOCUS - METALLURGY - Preferred Materials: The solid fuel includes an alloy consisting of aluminum-magnesium alloys, zinc-magnesium alloy, aluminum-zinc alloy, or aluminum-magnesium-zinc alloy.

TECHNOLOGY FOCUS - POLYMERS - Preferred Components: The cathode includes an electrically conducting sheet; and a catalytic polymer film bonded to a side of the sheet that faces the electrolyte, and including a highly electroconducting polymer having at least one heteroatom per backbone monomer unit of the polymer and transition metal atoms covalently bonded to at least a portion of the heteroatoms.

FS CPI EPI
FA AB; GI
MC CPI: L03-E04B
EPI: X16-E06A

L58 ANSWER 8 OF 11 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN

AN 2001-281334 [29] WPIX

CR 2003-046278 [04]; 2003-165730 [16]

DNN N2001-200613 DNC C2001-085474

TI Catalyst for fuel cell comprises highly electroconductive polymer complex with at least one heteroatom per monomer with transition metal atoms bonded to heteroatoms.

DC A26 A85 L03 P42 X16

IN BOROVER, G; FINKELSHTAIN, G; KATSMAN, Y; KATZMAN, Y; KHIKEL, M

PA (MEDI-N) MEDIS EL LTD; (FRIE-I) FRIEDMAN M M

CYC 94

PI WO 2001015253 A1 20010301 (200129)* EN 36 H01M004-86 <--

RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ
NL OA PT SD SE SL SZ TZ UG ZW

W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CR CU CZ DE DK DM

DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC

LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE

SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW

AU 2000063969 A 20010319 (200136) H01M004-86 <--

US 6380126 B1 20020430 (200235) B01J031-06

US 6479181 B2 20021112 (200278) H01M004-86 <--

US 2003008199 A1 20030109 (200311) H01M004-90 <--

US 6730350 B2 20040504 (200430) B05D005-12

ADT WO 2001015253 A1 WO 2000-US21068 20000803; AU 2000063969 A AU 2000-63969
20000803; US 6380126 B1 US 1999-377749 19990820; US 6479181 B2 Div ex US
1999-377749 19990820, US 2001-759231 20010116; US 2003008199 A1 CIP of US
1999-377749 19990820, Cont of US 2000-503592 20000214, US 2002-229055
20020828; US 6730350 B2 Div ex US 1999-377749 19990820, US 2001-759230
20010116

FDT AU 2000063969 A Based on WO 2001015253; US 2003008199 A1 CIP of US
6380126; US 6730350 B2 Div ex US 6380126

PRAI US 2000-503592 20000214; US 1999-377749 19990820;

US 2001-759231 20010116; US 2002-229055 20020828;

US 2001-759230 20010116

IC ICM B01J031-06; B05D005-12; H01M004-86; H01M004-90

ICS C25B003-00; H01M004-46; H01M004-58;

H01M008-08; H01R043-00

AB WO 200115253 A UPAB: 20040511

NOVELTY - Heterogeneous catalyst comprises highly conductive polymer (26,36) with at least one heteroatom per backbone monomer unit with transition metal atoms covalently bonded to

heteroatoms.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are included for: (i) an electrode comprising electrically conducting sheet and the catalytic polymer; (ii) method of making the electrode by complexing a highly conductive polymer with transition metal coordination complexes. The complex is reduced to allow the neutral oxidation state. The complex is dispersed in a solvent and an electrically conductive sheet is impregnated with the dispersion; (iii) a fuel cell comprising electrodes (30,40), liquid electrolyte (50) including an alcohol and polybasic acids and electrically conductive sheet. A catalytic polymer film (26,36) is bonded to the side of the sheet that faces the electrolyte; and (iv) a method of producing an electric current with the fuel cell with an anode and a cathode including catalytically active transition metal particles. A liquid anolyte including alcohol fuel and aqueous solution of conjugate polybasic acids is introduced into the fuel cell between the electrodes.

USE - The catalyst is used for fuel cells.

ADVANTAGE - The conductive polymer catalyst has increased catalytic activity and requires less platinum in the electrode. The polymer particles are very small so surface area of electrical contact with the electrode sheet is greater. The highly conductive polymer provides resistance to carbon monoxide poisoning of colloidal platinum particles.

DESCRIPTION OF DRAWING(S) - The figure shows a proton exchange membrane fuel cell.

Conductive polymer complex layer 26,36

Electrodes 30,40

Electrolyte 50

Dwg.3/7

TECH WO 200115253 A1UPTX: 20010528

TECHNOLOGY FOCUS - POLYMERS - Preferred Polymer: The electroconducting polymer is polyaniline, polypyrrole, polythiophene and polyfuran.

FS CPI EPI GMPI

FA AB; GI

MC CPI: A12-E06A; L03-E04

EPI: X16-E01C; X16-E06

L58 ANSWER 9 OF 11 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN

AN 1999-304795 [26] WPIX

DNC C1999-089612

TI Catalyst composition useful for olefin polymerization.

DC A17 A18 A60 E11 E12

IN GRUTER, G J M; HERKLOTS, M; KRANENBURG, M

PA (STAM) DSM NV

CYC 75

PI EP 919571 A1 19990602 (199926)* EN 27 C08F010-00

R: AL AT BE CH DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI

WO 9928358 A1 19990610 (199930) EN

RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SZ UG ZW

W: AL AU BA BB BG BR CA CN CU CZ EE GD GE HR HU ID IL IS JP KP KR LC LK LR LT LV MG MK MN MX NO NZ PL RO SG SI SK SL TR TT UA US UZ VN YU

AU 9913539 A 19990616 (199945)

EP 1028983 A1 20000823 (200041) EN C08F010-00

R: BE CH DE ES FI FR GB IT LI NL SE

EP 1028983 B1 20010919 (200155) EN C08F010-00

R: BE CH DE ES FI FR GB IT LI NL SE

DE 69801768 E 20011025 (200171) C08F010-00

ES 2162484 T3 20011216 (200206) C08F010-00

US 6489261 B1 20021203 (200301) B01J031-00
ADT EP 919571 A1 EP 1997-203755 19971201; WO 9928358 A1 WO 1998-NL675
19981130; AU 9913539 A AU 1999-13539 19981130; EP 1028983 A1 EP
1998-957236 19981130, WO 1998-NL675 19981130; EP 1028983 B1 EP 1998-957236
19981130, WO 1998-NL675 19981130; DE 69801768 E DE 1998-601768 19981130,
EP 1998-957236 19981130, WO 1998-NL675 19981130; ES 2162484 T3 EP
1998-957236 19981130; US 6489261 B1 Provisional US 1997-70187P 19971230,
Cont of WO 1998-NL675 19981130, US 2000-583914 20000531
FDT AU 9913539 A Based on WO 9928358; EP 1028983 A1 Based on WO 9928358; EP
1028983 B1 Based on WO 9928358; DE 69801768 E Based on EP 1028983, Based
on WO 9928358; ES 2162484 T3 Based on EP 1028983

PRAI EP 1997-203755 19971201

IC ICM B01J031-00; C08F010-00

ICS B01J037-00; C08F004-02; C08F004-44; C08F004-60; C08F004-642

AB EP 919571 A UPAB: 20011203

NOVELTY - A catalyst composition comprises a reduced transition metal complex in which a monoanionic ligand is bonded to the reduced transition metal via a covalent metal-carbon bond, and this ligand can non-covalently interact with the metal via a functional group(s).

DETAILED DESCRIPTION - A catalyst composition comprises a reduced transition metal complex (A) and a cocatalyst (B), in which (A) is of formula (X)(Km)-L1L2 (I);

M = Gp=IV, V or VI reduced transition metal;

X = multidentate monoanionic ligand of formula (Ar-Rt-)sY(-Rt-DR'n)q;

Y = cyclopentadienyl, amido (-NR'-), phosphido (-PR'-) or boratabenzene;

R = connecting group between Y and DR'n and/or between Y and Ar;

D = Gp=XV or XVI electron-donating heteroatom;

R' = H, hydrocarbon or heteroatom-containing moiety, except that R' can not be H when R' is directly bonded to D;

Ar = electron-donating aryl;

L1 = monoanionic ligand bonded to M via a covalent metal-carbon bond and additionally L1 can non-covalently interact with the metal via a functional group(s), where L1 is not cyclopentadienyl, amido, phosphido or unsubstituted benzyl;

L2 = anionic ligand which is not cyclopentadienyl, amido or phosphido;

K = neutral or anionic ligand bonded to M;

m = number of K ligands and for anionic K, m = 0 for M3+ when M is a Gp=IV, V or VI metal, m = 1 for M4+ when M is a Gp=V or VI metal, and m = 2 for M5+ when M is a Gp=VI metal, and for neutral K, m increases by 1 for each neutral K ligand;

n = 2 when D is from Gp=XV, and n = 1 when D is from Gp=XVI;

q+s = integer of 1 or more;

t = 0 or 1.

INDEPENDENT CLAIMS are also included for:

(1) a process for polymerizing an olefin using the catalyst composition; and

(2) the polyolefin obtained.

USE - For olefin polymerization.

ADVANTAGE - The reduced transition metal complex is stable and can often be obtained as a solid, so is easy to obtain in a pure form and easy to handle when used for olefin polymerization. It provides the catalyst composition with high activity and produces high yields of polyolefins.

TECH EP 919571 A1 UPTX: 19990707

TECHNOLOGY FOCUS - ORGANIC CHEMISTRY - The catalyst complexes were prepared as WO-A-96/13529. A preferred reduced transition metal complex is of formula (II);

M(III) = Gp=IV, V or VI transition metal in oxidation state 3+.
The cocatalyst is an aluminoxane, triaryl borane, tetraaryl borate or silicate. (A) and/or (B) is supported on a carrier(s).

TECHNOLOGY FOCUS - POLYMERS - The olefin is an alpha-olefin comprising ethylene, propylene, butene, pentene, heptene, octene and/or styrene. Preferably the polymer is one based on ethylene and/or propylene, or is a rubber-like polymer based on ethylene, an alpha-olefin and optionally a diene.

ABEX EP 919571 A1 UPTX: 19990707

EXAMPLE - Pentafluorophenyl bromide (7.8ml) was added to a 1.6M solution of butyllithium (38ml) in ether (75ml) at -70degreesC under nitrogen over 15 minutes. After stirring for 2 hours at -70degreesC, the pentafluorophenyl lithium solution was added to a slurry at -70degreesC of ((Me2NC2H4)C5H2(SiMe3)2)TiCl2 (12.44g) in ether (300ml). After warming to 0degreesC, the clear ether layer was decanted from the formed lithium chloride, and the ether was evaporated. After recovery using ligroin, a 82% yield of ((Me2NC2H4)C5H2(SiMe3)2Ti(C6F5)2 was obtained as a purple powder. Polymerization of ethylene was carried out under solution conditions by heating pentamethyl heptane (400ml) and ethylene in a reactor at 150degreesC under a pressure of 2 MPa. A premix was made of sufficient Al-(C8H17)3 and (PhNMe2H)(B(C6F5)4) cocatalyst in 1.6M toluene, and the prepared catalyst complex, to give an aluminum compound/Ti ratio of 40 and a boron compound/Ti ratio of 2. After mixing at room temperature for 1 minute, this was added to the reactor and polymerization was carried out for 10 minutes under a constant pressure maintained by supplying ethylene. The yield of polymer was 44 kg/g Ti per 5 minutes, compared with 33 kg/g Ti per 5 minutes for (Me2NC2H4C5Me4)TiMe2.

DEFINITIONS - Preferred Definitions:

Y = di-, tri- or tetraalkyl cyclopentadienyl, or optionally substituted indenyl, benzoindenyl or fluorenyl;

M = Cr or Ti;

D = N or P;

R' = n-alkyl;

R = group (-ER'2-)p;

p = 1-4;

E = element from Gp=XIV;

L1 = phenyl in which an ortho-position(s) is substituted with a functional group capable of donating electron density to M, or methyl in which an alpha-position(s) is substituted with such a functional group, where the functional group is an atom of Gp=XVII or a group containing an element(s) from Gps=XV, XVI or XVII, preferably benzyl with an ortho-position(s) substituted with such a functional group.

Preferably

L1 = 2,6-difluorophenyl, 2,4,6-trifluorophenyl, pentafluorophenyl, 2-alkoxyphenyl, 2,6-dialkoxyphenyl, 2,4,6-tri(trifluoromethyl)phenyl, 2,6-di(trifluoromethyl)phenyl, 2-trifluoromethylphenyl, 2-(dialkylamino)benzyl or 2,6-(dialkylamino)phenyl, especially pentafluorophenyl or 2,6-dimethoxyphenyl;

L2 optionally = L1

FS CPI

FA AB; GI; DCN

MC CPI: A02-A06E; A02-A07A; A02-D; A04-G01A; A10-B01; E05-C02; E05-E01; E05-G02; E05-L01; E05-L03A; E05-S; E10-B04A2; E31-B03D; E31-P03

L58 ANSWER 10 OF 11 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN

AN 1998-169875 [16] WPIX

DNC C1998-054479

TI Catalyst of metal bound to surface of carbon support - has low

valent metal covalently bound to amorphous carbon with non-hexagonal rings and curved surface at molecular level, e.g. onion carbon.

DC E19 H04 J04
 IN BELZ, T; BRAUN, T; SCHLOEGEL, R; WOHLERS, M; SCHLOEGL, R; SCHLOGL, R
 PA (PLAC) MAX PLANCK GES FOERDERUNG WISSENSCHAFTEN
 CYC 20
 PI DE 19636269 A1 19980312 (199816)* 7 B01J021-18
 WO 9809725 A1 19980312 (199817) GE 22 B01J021-18
 RW: AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL PT SE
 W: JP US
 EP 925111 A1 19990630 (199930) GE B01J021-18
 R: AT BE CH DE DK ES FI FR GB IE IT LI NL SE
 DE 19636269 C2 19991230 (200005) B01J021-18
 JP 2000517242 W 20001226 (200104) 17 B01J021-18
 EP 925111 B1 20010711 (200140) GE B01J021-18
 R: AT BE CH DE DK ES FI FR GB IE IT LI NL SE
 DE 59704030 G 20010816 (200148) B01J021-18
 US 2002132863 A1 20020919 (200264) B01J021-18
 US 6653509 B2 20031125 (200378) C07C209-00
 ADT DE 19636269 A1 DE 1996-1036269 19960906; WO 9809725 A1 WO 1997-EP4842
 19970905; EP 925111 A1 EP 1997-944838 19970905; WO 1997-EP4842 19970905;
 DE 19636269 C2 DE 1996-1036269 19960906; JP 2000517242 W WO 1997-EP4842
 19970905; JP 1998-512252 19970905; EP 925111 B1 EP 1997-944838 19970905;
 WO 1997-EP4842 19970905; DE 59704030 G DE 1997-504030 19970905; EP
 1997-944838 19970905; WO 1997-EP4842 19970905; US 2002132863 A1 CIP of WO
 1997-EP4842 19970905, CIP of US 1999-147760 19990504, Div ex US
 2000-535748 20000327, US 2002-121728 20020415; US 6653509 B2 CIP of WO
 1997-EP4842 19970905, CIP of US 1999-147760 19990504, Div ex US
 2000-535748 20000327, US 2002-121728 20020415
 FDT EP 925111 A1 Based on WO 9809725; JP 2000517242 W Based on WO 9809725; EP
 925111 B1 Based on WO 9809725; DE 59704030 G Based on EP 925111, Based on
 WO 9809725
 PRAI DE 1996-19636269 19960906
 IC ICM B01J021-18; C07C209-00
 ICS B01J031-22; B01J032-00; B01J037-34; C01B031-02; C07B031-00;
 C07C001-04; C07C005-00; C07C009-04; C07C027-00; C07C027-06;
 C07C037-00
 ICA C07B035-02; C07B061-00
 AB DE 19636269 A UPAB: 20040123
 In a catalyst of catalytically active metal(s) in a low valency
 state on a carbon support, the support comprises a carbon ring, which is
 not six-sided and has a curved surface at the molecular level in the
 amorphous state, and the metal is bound covalently to the support.
 Also claimed is the production of the catalyst.
 USE - Used in the hydrogenation of carbon monoxide (CO) and liquid
 phase hydrogenation of organic molecules (claimed).
 ADVANTAGE - Graphite supports, which have a layered structure, and
 metals have little mutual attraction, so that the metals tend to be
 deactivated by agglomeration, especially at elevated temperature.
 Fullerenes form intercalation compounds but are expensive. In addition
 some of the metal is inside the macroscopic fullerene particles and not
 available for catalysis. With the present carbon supports (e.g. onion
 carbon), all the metal is fixed to the surface and hence very readily
 available for the reactants. These catalysts are stable at
 higher temperature than those on graphite and have better and sometimes
 different catalytic properties. The support can be produced by the
 Kraetscher method or in other ways.
 Dwg.0/2
 FS CPI
 FA AB; DCN

MC CPI: E31-N04D; E35; E35-X; H04-E08; H04-F02E; J04-E04B; N05-B; N06-F

L58 ANSWER 11 OF 11 WPIX COPYRIGHT 2005 THE THOMSON CORP on STN

AN 1991-117360 [16] WPIX

DNC C1991-050485

TI Support for chromatography or electrophoresis - comprises inorganic oxide intermediate with surface hydride gps., with organic coating covalently bonded via metal-carbon bonds.

DC E11 J01 J04

IN PESEK, J J; SANDOVAL, E; SANDOVAL, J E

PA (PESE-I) PESEK J J; (SAND-I) SANDOVAL E; (SAND-I) SANDOVAL J E

CYC 14

PI WO 9104095 A 19910404 (199116)*

RW: AT BE CH DE DK ES FR GB IT LU NL SE

W: JP US

US 5017540 A 19910521 (199123)

US 5326738 A 19940705 (199426) 8 B01J020-06

ADT US 5017540 A US 1989-407816 19890915; US 5326738 A CIP of US 1989-407816 19890915, WO 1990-US5202 19900913, US 1992-838429 19920309

FDT US 5326738 A CIP of US 5017540, Based on WO 9104095

PRAI US 1989-407816 19890915

REP US 4904632; US 4946818; US 4959340

IC B01J020-02

ICM B01J020-06

ICS B01J020-02; B01J020-22; B01J020-30

AB WO 9104095 A UPAB: 19930928

A solid intermediate, useful in chromatographic or electrophoretic sepns after derivatisation, comprises an inorganic oxide-based, relatively rigid surface bearing hydride gps, the surface being exposable to fluids with components being separated Solid substrate comprises the intermediate bearing a hydrolytically stable organic coating on at least part of the surface bonded via direct metal-carbon linkages.

USE/ADVANTAGE - Useful in a variety of liq and gas chromatographic sepns and capillary electrophoresis. The material has an extended lifetime, displays improved adsorption properties, and is free of contaminants. Applications include HPLC, HPCE, reverse-phase, HPLC, affinity chromatography, size-exclusion chromatography, etc.

0/6

FS CPI

FA AB; DCN

MC CPI: E11-Q01; E11-Q03E; E31-P03; E34-C02; E35-H; E35-K02; E35-L; J01-D01A; J01-E03A; J03-C; J04-B01C

=> FILE HCAPL

FILE 'HCAPLUS' ENTERED AT 12:42:08 ON 02 DEC 2005

USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.

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OR 7440-15-5/BI OR 7440-16-6/BI OR 7440-18-8/BI OR 7440-44-0/BI
OR 7440-48-4/BI OR 7704-34-9/BI OR 7723-14-0/BI OR 7727-37-9/B
I OR 7782-44-7/BI)

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L5 1938 SEA FILE=HCAPLUS ABB=ON L4 (L)CAT/RL

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NANO?)

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L13 3 SEA FILE=HCAPLUS ABB=ON L6 OR L8 OR L12

L14 10 SEA FILE=REGISTRY ABB=ON L2 AND 1/M

L15 1 SEA FILE=REGISTRY ABB=ON CARBON/CN

L16 1 SEA FILE=REGISTRY ABB=ON GRAPHITE/CN

L17 1 SEA FILE=REGISTRY ABB=ON "CARBON BLACK"/CN

L18 3 SEA FILE=REGISTRY ABB=ON (L15 OR L16 OR L17)

L19 1 SEA FILE=REGISTRY ABB=ON SULFUR/CN

L24 16891 SEA FILE=HCAPLUS ABB=ON SUPPORT? (4A) (CARBON OR GRAPHITE OR
NANO?)

L25 64 SEA FILE=HCAPLUS ABB=ON L5 AND L24

L26 2 SEA FILE=HCAPLUS ABB=ON L25 AND ELECTROCHEM?/SC, SX

L27 974206 SEA FILE=HCAPLUS ABB=ON L14

L28 177723 SEA FILE=HCAPLUS ABB=ON (L27 OR PT OR PLATINUM OR RU OR
RUTHENIUM OR MN OR MANGANESE OR IRON OR FE OR CO OR COBALT OR
NI OR NICKEL OR RH OR RHODIUM OR PD OR PALLADIUM OR RH OR
RHENIUM OR IR OR IRIIDIUM) (L)CAT/RL

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GRAPHITE OR NANO? OR L18)

L30 7874 SEA FILE=HCAPLUS ABB=ON L28 AND L29

L34 1152 SEA FILE=HCAPLUS ABB=ON (L19 OR S OR SULFUR OR P OR PHOSPHORUS
OR O OR OXYGEN OR N OR NITROGEN) (L)MOA/RL (L) (CATALY? OR
CAT/RL)

L35 22 SEA FILE=HCAPLUS ABB=ON L30 AND L34

L36 7 SEA FILE=HCAPLUS ABB=ON L30 AND COVALENT? (2A) BOND?

L37 48 SEA FILE=HCAPLUS ABB=ON METAL? (2A) COVALENT? (2A) (CARBON OR C
OR GRAPHITE? OR NANO?)

L38 4 SEA FILE=HCAPLUS ABB=ON L37 AND CAT/RL

L39 131618 SEA FILE=HCAPLUS ABB=ON (L19 OR S OR SULFUR OR P OR PHOSPHORUS
OR O OR OXYGEN OR N OR NITROGEN) (4A) CATALY?

L40 1050 SEA FILE=HCAPLUS ABB=ON L30 AND L39

L41 1 SEA FILE=HCAPLUS ABB=ON L40 AND COVALENT? (2A) BOND?

L42 38 SEA FILE=HCAPLUS ABB=ON L13 OR L26 OR L35 OR L36 OR L38 OR
L41

=> FILE COMPENDEX

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=> D QUE L72

L43 7255 SEA FILE=WPIX ABB=ON (CARRIER? OR SUPPORT?) (4A) (CARBON OR GRAPHITE OR NANO?)

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L45 3173 SEA FILE=WPIX ABB=ON L43 AND L44

L59 145 SEA FILE=COMPENDEX ABB=ON L45 AND (S OR SULFUR OR P OR PHOSPHORUS OR O OR OXYGEN OR N OR NITROGEN) (4A) CATALY?

L60 10 SEA FILE=COMPENDEX ABB=ON METAL? (2A) COVALENT? (2A) (CARBON OR C OR GRAPHITE? OR NANO?)

L61 14 SEA FILE=COMPENDEX ABB=ON COVALENT? (2A) BOND? AND METAL? (3A) CAT ALY?

L62 99226 SEA FILE=COMPENDEX ABB=ON CATALYSTS+NT/CT

L63 6 SEA FILE=COMPENDEX ABB=ON L61 AND L62

L64 0 SEA FILE=COMPENDEX ABB=ON L60 AND L62

L65 91 SEA FILE=COMPENDEX ABB=ON L59 AND L62

L68 87240 SEA FILE=COMPENDEX ABB=ON CARBON+NT/CT

L69 38 SEA FILE=COMPENDEX ABB=ON L65 AND L68

L70 14184 SEA FILE=COMPENDEX ABB=ON (S OR SULFUR OR P OR PHOSPHORUS OR O OR OXYGEN OR N OR NITROGEN) (4A) (CARRIER? OR SUPPORT?)

L71 11 SEA FILE=COMPENDEX ABB=ON L69 AND L70

L72 17 SEA FILE=COMPENDEX ABB=ON L63 OR L64 OR L71

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L44 1103076 SEA FILE=WPIX ABB=ON (PT OR PLATINUM OR RU OR RUTHENIUM OR MN OR MANGANESE OR IRON OR FE OR CO OR COBALT OR NI OR NICKEL OR RH OR RHODIUM OR PD OR PALLADIUM OR RH OR RHENIUM OR IR OR IRIIDIUM)

L45 3173 SEA FILE=WPIX ABB=ON L43 AND L44

L73 18 SEA FILE=JICST-EPLUS ABB=ON L45 AND (S OR SULFUR OR P OR PHOSPHORUS OR O OR OXYGEN OR N OR NITROGEN) (4A) CATALY?

L76 63 SEA FILE=JICST-EPLUS ABB=ON COVALENT? (2A) BOND? AND METAL? (3A) C ATALY?

L77 3745 SEA FILE=JICST-EPLUS ABB=ON (S OR SULFUR OR P OR PHOSPHORUS

OR O OR OXYGEN OR N OR NITROGEN) (4A) (CARRIER? OR SUPPORT?)
L78 7 SEA FILE=JICST-EPLUS ABB=ON L73 AND L77
L80 0 SEA FILE=JICST-EPLUS ABB=ON L76 AND L77
L81 7 SEA FILE=JICST-EPLUS ABB=ON L78 OR L80

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L82 62 DUP REM L42 L72 L81 (0 DUPLICATES REMOVED)

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L82 ANSWER 1 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2005:395671 HCAPLUS

DN 142:449379

ED Entered STN: 09 May 2005

TI Membrane-electrode laminate for solid polymer fuel cell and its
manufacture

IN Tanuma, Toshihiro

PA Asahi Glass Company, Limited, Japan

SO PCT Int. Appl., 36 pp.

CODEN: PIXXD2

DT Patent

LA Japanese

IC ICM H01M004-86

ICS H01M008-10; H01M008-02

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2005041330	A1	20050506	WO 2004-JP15528	20041020
	W:				
	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH,				
	CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD,				
	GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,				
	LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI,				
	NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY,				
	TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
	RW:				
	BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM,				
	AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK,				
	EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE,				
	SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE,				
	SN, TD, TG				
PRAI	JP 2003-364352	A	20031024		
	JP 2004-76309	A	20040317		
	JP 2004-76310	A	20040317		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
WO 2005041330	ICM	H01M004-86
	ICS	H01M008-10; H01M008-02
WO 2005041330	ECLA	H01M004/86B; H01M004/88; H01M008/10B2

AB The laminate comprises an anode and a cathode each having a catalyst layer which contains a catalyst powder composed of catalyst metal particles supported by carbon carriers and an ion-exchange resin, and an ion-exchange membrane interposed between the catalyst layer of the anode and the catalyst layer of the cathode; where ≥ 1 of the catalyst layers of the anode and cathode contains an amine whose solubility in water at 20° is ≤ 3 , and the content of such an amine relative to the catalyst powder, $(W + N)/M + 1000$ (W = content (g) of the amine per 1 g of the catalyst powder; M = mol. weight of the amine; and N = number of basic nitrogen atoms in one amine mol.), is 0.03-1. The method for manufacturing the above laminate is also disclosed.

ST fuel cell membrane electrode laminate catalyst layer amine manuf

IT Ion exchange membranes
(Flemion; structure and manufacture of membrane-electrode laminates contains amines in electrode catalyst layers for solid polymer fuel cells)

IT Fuel cell electrodes
Fuel cell electrolytes
(structure and manufacture of membrane-electrode laminates contains amines in electrode catalyst layers for solid polymer fuel cells)

IT 7440-06-4, Platinum, uses
RL: CAT (Catalyst use); USES (Uses)
(structure and manufacture of membrane-electrode laminates contains amines in electrode catalyst layers for solid polymer fuel cells)

IT 7440-44-0, Carbon, uses 9003-07-0, Polypropylene 9003-70-7D, Divinyl benzene-styrene copolymer, sulfonated 25667-42-9D, Polyether sulfone, sulfonated 31175-20-9 64022-61-3, ADK Stab LA57 851223-34-2 851223-35-3
RL: DEV (Device component use); USES (Uses)
(structure and manufacture of membrane-electrode laminates contains amines in electrode catalyst layers for solid polymer fuel cells)

IT 104-75-6, 2-Ethyl hexyl amine 109-55-7 110-89-4, Piperidine, uses 110-96-3, Diisobutyl amine 1116-76-3, Tri-n-octyl amine 52829-07-9, ADK Stab LA77 71878-19-8, Chimassorb 944 106990-43-6, Chimassorb 119
RL: MOA (Modifier or additive use); USES (Uses)
(structure and manufacture of membrane-electrode laminates contains amines in electrode catalyst layers for solid polymer fuel cells)

RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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(2) Asahi Glass Co Ltd; JP 200359494 A 2003

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(4) Matsushita Electric Industrial Co Ltd; JP 200386187 A 2003

IT 7440-06-4, Platinum, uses
RL: CAT (Catalyst use); USES (Uses)
(structure and manufacture of membrane-electrode laminates contains amines in electrode catalyst layers for solid polymer fuel cells)

RN 7440-06-4 HCAPLUS

CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

L82 ANSWER 2 OF 62 COMPENDEX COPYRIGHT 2005 EEI on STN
AN 2005(31):4191 COMPENDEX
TI Support effects in hydrogenation of cinnamaldehyde over carbon nanofiber-supported platinum catalysts: Kinetic modeling.
AU Toebe, Marjolein L. (Department of Inorganic Chemistry and Catalysis Debye Institute Utrecht University, 3508 TB Utrecht, Netherlands); Nijhuis, T. Alexander; Hajek, Jan; Bitter, Johannes H.; Van Dillen, A. Jos; Murzin, Dmitry Yu.; De Jong, Krijn P.
SO Chemical Engineering Science v 60 n 21 November 2005 2005.p 5682-5695
CODEN: CESCAC ISSN: 0009-2509
PY 2005
DT Journal
TC Experimental
LA English
AB Carbon nanofiber-supported platinum catalysts with a narrow and stable platinum particle size distribution (1-2 nm) were prepared, one with a considerable amount of oxygen support surface groups (PtCNF, 2.8 acidic O atoms/nm²) and one with a much smaller amount (PtCNF973, 0.06 acidic O atoms/nm²). Their catalytic performance was compared in a series of liquid-phase cinnamaldehyde hydrogenation experiments at 383 K using hydrogen pressures of 2.8-6.8 MPa and a cinnamaldehyde concentration in the range 14-345mol/m³. These results showed a different hydrogen dependency of the reaction rate for the two catalysts, demonstrating a change in the adsorption of hydrogen on platinum. Using a single-site model including both Langmuir-Hinshelwood kinetics and mass transfer effects we found that the intrinsic reaction rate increased up to a factor of 120 with the removal of the oxygen-containing surface groups. Also the adsorption constants increased significantly, indicating that adsorption on PtCNF973 is stronger than on PtCNF. These results suggest that hydrogenation is assisted by adsorption of the benzene ring of cinnamaldehyde on the non-polar CNF support surface after removal of the oxygen-containing groups. \$CPY 2005 Elsevier Ltd. All rights reserved. 36 Refs.
CC 804.1 Organic Compounds; 803 Chemical Agents and Basic Industrial Chemicals; 547.1 Precious Metals; 802.2 Chemical Reactions; 802.3 Chemical Operations; 933.1 Crystalline Solids
CT *Aldehydes; Particle size analysis; Catalyst supports; Aromatic compounds; Hydrogenation; Adsorption; Nanostructured materials; Catalysts; Platinum; Carbon fibers; Oxygen; Benzene
ST Carbon nanofibers; Oxygen support surface groups; Adsorption constants; Langmuir-Hinshelwood kinetics
ET C*F*N*Pt; PtCNF; Pt cp; cp; C cp; N cp; F cp; O

L82 ANSWER 3 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2005:821964 HCAPLUS
DN 143:424587
ED Entered STN: 19 Aug 2005
TI Nitrogen containing carbon nanotubes as supports for Pt - Alternate anodes for fuel cell applications
AU Maiyalagan, T.; Viswanathan, B.; Varadaraju, U. V.
CS Department of Chemistry, Indian Institute of Technology Madras, Chennai, 600 036, India
SO Electrochemistry Communications (2005), 7(9), 905-912
CODEN: ECCMF9; ISSN: 1388-2481
PB Elsevier B.V.
DT Journal
LA English

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

AB Aligned nitrogen-containing carbon nanotubes have been synthesized using Anodisc alumina membrane as template. Highly dispersed platinum nanoparticles have been supported on the nitrogen-containing carbon nanotubes. Nitrogen-containing carbon nanotubes as platinum catalyst supports were characterized by electron microscopic technique and electrochem. anal. The EDX patterns show the presence of Pt and the micrograph of TEM shows that the Pt particles are uniformly distributed on the surface of the nitrogen-containing carbon nanotubes with an average particle size of 3 nm. Cyclic voltammetry studies revealed a higher catalytic activity of the nitrogen-containing carbon nanotube supported Pt catalysts.

ST carbon nanotube nitrogen support platinum catalyst anode fuel cell

IT Nanotubes
(carbon; preparation of nitrogen-containing carbon nanotubes as supports for platinum catalyst for anodes of fuel cells)

IT Fuel cell anodes
(catalytic; preparation of nitrogen-containing carbon nanotubes as supports for platinum catalyst for anodes of fuel cells)

IT Catalyst supports
(preparation of nitrogen-containing carbon nanotubes as supports for platinum catalyst for anodes of fuel cells)

IT 7440-44-0, Carbon, uses
RL: CAT (Catalyst use); CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(nanotubes; preparation of nitrogen-containing carbon nanotubes as supports for platinum catalyst for anodes of fuel cells)

IT 7440-06-4, Platinum, uses
RL: CAT (Catalyst use); DEV (Device component use); USES (Uses)
(preparation of nitrogen-containing carbon nanotubes as supports for platinum catalyst for anodes of fuel cells)

IT 7727-37-9, Nitrogen, uses
RL: MOA (Modifier or additive use); USES (Uses)
(preparation of nitrogen-containing carbon nanotubes as supports for platinum catalyst for anodes of fuel cells)

RE.CNT 39 THERE ARE 39 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE

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IT 7440-06-4, Platinum, uses
RL: CAT (Catalyst use); DEV (Device component use); USES (Uses)
(preparation of nitrogen-containing carbon nanotubes as supports for platinum catalyst for anodes of fuel cells)
RN 7440-06-4 HCAPLUS
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

- L82 ANSWER 4 OF 62 COMPENDEX COPYRIGHT 2005 EEI on STN
AN 2005(44):2395 COMPENDEX
TI From homogeneous to heterogeneous catalysis: Supported Pd(II) metal complexes with chiral triaza donor ligands: Comparative catalytic study with Rh(I) and Ir(I) complexes for hydrogenation reactions.
AU Gonzalez-Arellano, Camino (Instituto de Ciencia de Materiales de Madrid CSIC, Cantoblanco, 28049 Madrid, Spain); Corma, Avelino; Iglesias, Marta; Sanchez, Felix
SO Catalysis Today v 107-108 Oct 30 2005 2005.p 362-370
CODEN: CATTEA ISSN: 0920-5861
PY 2005
DT Journal
TC Theoretical
LA English
AB Palladium complexes with the chiral triaza ligands N,N'-bis {[(S) - (1-benzylpyrrolidin-2-yl)] methyl } amine and N,N' -bis {[(S) - (1-benzylpyrrolidin-2-yl)] methyl } -N-propylamine have been obtained. The fixation of the preformed palladium complex, -{ [Pd (N,N' -bis {[(S) - (1-benzylpyrrolidin-2-yl)] methyl } -N- [3- (triethoxysilyl) propyl] amine) (cod)] PF6 }, on mesostructured silicates and delaminated zeolites (silica, MCM-41, ITQ-2 and ITQ-6) and their use, under heterogeneous conditions, for the hydrogenation reactions are reported. The catalytic activity and

selectivity are higher to that observed under homogeneous conditions, as a consequence of the complex- and/or reagents-to-support interaction. The strength of stable covalent bond between support and supported complex allows the recovery and recycling of the supported catalysts for a number of cycles. Atomic absorption analysis of the reaction solutions shows that there is no metal leaching into the solutions. A comparative catalytic study with the respective Rh(I) and Ir(I) complexes for olefin hydrogenation reactions was also given. \$CPY 2005 Elsevier B.V. All rights reserved. 33 Refs.

CC 547.1 Precious Metals; 802.2 Chemical Reactions; 803 Chemical Agents and Basic Industrial Chemicals
CT *Palladium; Catalysis; Catalysts; Complexation; Hydrogenation
ST Metal leaching; Olefin hydrogenation; Immobilization
ET N; Pd

L82 ANSWER 5 OF 62 COMPENDEX COPYRIGHT 2005 EEI on STN

AN 2005(17):7095 COMPENDEX

TI Enhancement of oxygen electroreduction activity via surface modification of carbon supported ruthenium nanoparticles: A new class of electrocatalysts.

AU Bron, M. (TU Darmstadt Ernst-Berl-Inst. of Chem. Technology TC II, D-64287 Darmstadt, Germany); Bogdanoff, P.; Fiechter, S.; Tributsch, H.

SO Journal of Electroanalytical Chemistry v 578 n 2 May 1 2005 2005.p 339-344
CODEN: JECHES ISSN: 0022-0728

PY 2005

DT Journal

TC Experimental

LA English

AB Oxygen reduction catalysts have been prepared by modifying Ru/C catalysts (either commercial or self-made) using iron phenanthroline complexes adsorbed at the surface of the catalysts and heat treated at elevated temperatures. This new type of catalyst shows an oxygen reduction activity which is 3-5 times higher than the activity of an unmodified Ru/C catalyst. Furthermore, it is higher than that of catalysts based on Ru/C modified with Se, however, the activity of Pt/C is still not yet matched. Structural characterisation indicates that the catalysts consist of ruthenium nanoparticles. These nanoparticles most likely are covered by centres of type Fe_NCy also found in carbon supported iron catalyst for oxygen reduction prepared by pyrolysis of iron, nitrogen and carbon via heat treatment steps. \$CPY 2005 Elsevier B.V. All rights reserved. 39 Refs.

CC 801.4.1 Electrochemistry; 802.2 Chemical Reactions; 804 Chemical Products Generally; 547.1 Precious Metals; 933.1 Crystalline Solids; 803 Chemical Agents

CT *Electrochemistry; Complexation; Heat treatment; Adsorption; Nanostructured materials; Catalysts; Iron; Reduction; Oxygen; Surface treatment; Carbon; Ruthenium

ST Electrocatalysis; Oxygen reduction; Catalyst modification; Iron catalysts

ET Ru; Se; Pt; Fe*N; FeN; Fe cp; cp; N cp

L82 ANSWER 6 OF 62 COMPENDEX COPYRIGHT 2005 EEI on STN

AN 2005(35):13297 COMPENDEX

TI The influence of carbon support porosity on the activity of PtRu/Sibunit anode catalysts for methanol oxidation.

AU Rao, V. (Boreskov Institute of Catalysis Russian Academy of Sciences, 630090 Novosibirsk, Russian Federation); Simonov, P.A.; Savinova, E.R.; Plaksin, G.V.; Cherepanova, S.V.; Kryukova, G.N.; Stimming, U.

- SO Journal of Power Sources v 145 n 2 Aug 18 2005 2005.p 178-187
Selected Papers Presented at the Fuel Cells Science and Technology Meeting
CODEN: JPSODZ ISSN: 0378-7753
- PY 2005
DT Journal
TC Experimental
LA English
AB In this paper we analyse the promises of homemade carbon materials of Sibunit family prepared through pyrolysis of natural gases on carbon black surfaces as supports for the anode catalysts of direct methanol fuel cells. Specific surface area (SBET) of the support is varied in the wide range from 6 to 415 m² g⁻¹ and the implications on the electrocatalytic activity are scrutinized. Sibunit supported PtRu (1:1) catalysts are prepared via chemical route and the preparation conditions are adjusted in such a way that the particle size is constant within +/- 1 nm in order to separate the influence of support on the (i) catalyst preparation and (ii) fuel cell performance. Comparison of the metal surface area measured by gas phase CO chemisorption and electrochemical CO stripping indicates close to 100% utilisation of nanoparticle surfaces for catalysts supported on low (22-72 m² g⁻¹) surface area Sibunit carbons. Mass activity and specific activity of PtRu anode catalysts change dramatically with S BET of the support, increasing with the decrease of the latter. 10%PtRu catalyst supported on Sibunit with specific surface area of 72 m² g⁻¹ shows mass specific activity exceeding that of commercial 20%PtRu/Vulcan XC-72 by nearly a factor of 3. \$CPY 2005 Elsevier B.V. All rights reserved. 53 Refs.
- CC 931.2 Physical Properties of Gases, Liquids and Solids; 804 Chemical Products Generally; 803 Chemical Agents and Basic Industrial Chemicals; 804.2 Inorganic Compounds; 802.2 Chemical Reactions; 804.1 Organic Compounds
- CT *Porosity; Platinum compounds; Oxidation; Methanol; Pyrolysis; Natural gas; Carbon black; Carbon; Catalysts
- ST Carbon support; Sibunit carbons; PtRu anodes; DMFC; Catalyst utilization; Anode performance
- ET PtRu; Pt sy 2; sy 2; Ru sy 2; PtRu; Pt cp; cp; Ru cp; C*O; CO; C cp; O cp; S
- L82 ANSWER 7 OF 62 JICST-EPlus COPYRIGHT 2005 JST on STN
- AN 1050138695 JICST-EPlus
- TI Electrocatalyst for Polymer Electrolyte Membrane Fuel Cells
- AU TADA TOMOYUKI
- CS Tanaka Kikinzoku Kogyo K. K.
- SO Jidosha Gijutsu (Journal of the Society of Automotive Engineers of Japan), (2005) vol. 59, no. 2, pp. 103-108. Journal Code: F0387A (Fig. 11, Ref. 7) ISSN: 0385-7298
- CY Japan
- DT Journal; Commentary
- LA Japanese
- STA New
- AB Platinum and platinum alloy catalysts supported on carbon material are mainly used for electrocatalyst for polymer electrolyte membrane fuel cells. The effect of carbon materials as catalyst's support on fuel cell performance, the improvement of catalytic activity of oxygen reduction reaction by using platinum alloy catalyst, and platinum particle growth under fuel cell operation are discussed to introduce R&D activity of electrocatalyst for fuel cells. (author abst.)
- CC YB04040V; CB07050F; QG07020B (621.352.6; 544.653; 629.33-83)

CT electrode catalyst; solid electrolyte fuel cell; ruthenium;
platinum catalyst; carbon black; time course; electric automobile;
surface area; adsorption; transmission electron microscope; particle size
distribution; fuel cell; polyelectrolyte

BT catalyst; chemical cell; battery; platinum group metal;
transition metal; metallic element; element; transition metal catalyst;
metal catalyst; carbon material; inorganic material; material; variation;
automobile; area; geometric quantity; electron microscope; microscope;
distribution; functional polymer; macromolecule; electrolyte; matter

ST polymer electrolyte fuel cell; fuel cell vehicle

L82 ANSWER 8 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2004:220634 HCAPLUS

DN 140:238522

ED Entered STN: 19 Mar 2004

TI Fuel cell electrode comprising CO and sulfur tolerant metal compound
hydrogen activation catalyst

IN Chianelli, Russell R.; Jacobson, Alan

PA Board of Regents, the University of Texas System, USA; University of
Houston System

SO PCT Int. Appl., 24 pp.

CODEN: PIXXD2

DT Patent

LA English

IC ICM H01M

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 67, 72, 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2004023581	A2	20040318	WO 2003-US27874	20030905
	WO 2004023581	A3	20050310		
	W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW			
	RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
	US 2004086772	A1	20040506	US 2003-654860	20030904
PRAI	US 2002-408779P	P	20020906		
	US 2003-654860	A1	20030904		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
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WO 2004023581	ICM	H01M
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US 2004086772	NCL	429/040.000
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AB The present invention relates to a novel hydrogen activation catalysts based on a metal compound. More particularly, this invention describes a catalyst that is poison tolerant and has a high resistance to poisoning by carbon monoxide or sulfur containing species that can be used in fuel cells including a proton exchange membrane fuel cell.

ST fuel cell electrode metal compd hydrogen activation catalyst; carbon monoxide tolerant catalyst fuel cell; sulfur tolerant catalyst fuel cell

IT Nanotubes

(carbon, support; fuel cell electrode comprising CO and sulfur tolerant metal compound hydrogen activation catalyst)

- IT Catalysts
(electrocatalysts; fuel cell electrode comprising CO and sulfur tolerant metal compound hydrogen activation catalyst)
- IT Polyoxyalkylenes, uses
RL: MOA (Modifier or additive use); USES (Uses)
(fluorine- and sulfo-containing, ionomers; fuel cell electrode comprising CO and sulfur tolerant metal compound hydrogen activation catalyst)
- IT Ceramics
(foam, catalyst support; fuel cell electrode comprising CO and sulfur tolerant metal compound hydrogen activation catalyst)
- IT Conducting polymers
Electrolytic cells
Fuel cell electrodes
Sensors
(fuel cell electrode comprising CO and sulfur tolerant metal compound hydrogen activation catalyst)
- IT Polyacetylenes, uses
Polyanilines
RL: TEM (Technical or engineered material use); USES (Uses)
(fuel cell electrode comprising CO and sulfur tolerant metal compound hydrogen activation catalyst)
- IT Fuel cells
(phosphoric acid; fuel cell electrode comprising CO and sulfur tolerant metal compound hydrogen activation catalyst)
- IT Fluoropolymers, uses
RL: MOA (Modifier or additive use); USES (Uses)
(polyoxyalkylene-, sulfo-containing, ionomers; fuel cell electrode comprising CO and sulfur tolerant metal compound hydrogen activation catalyst)
- IT Ionomers
RL: MOA (Modifier or additive use); USES (Uses)
(polyoxyalkylenes, fluorine- and sulfo-containing; fuel cell electrode comprising CO and sulfur tolerant metal compound hydrogen activation catalyst)
- IT Fuel cells
(regenerative fuel cells; fuel cell electrode comprising CO and sulfur tolerant metal compound hydrogen activation catalyst)
- IT Fuel cells
(solid electrolyte, proton exchange membrane; fuel cell electrode comprising CO and sulfur tolerant metal compound hydrogen activation catalyst)
- IT Carbon black, uses
Zeolites (synthetic), uses
RL: TEM (Technical or engineered material use); USES (Uses)
(support; fuel cell electrode comprising CO and sulfur tolerant metal compound hydrogen activation catalyst)
- IT 1314-23-4, Zirconia, uses
RL: CAT (Catalyst use); TEM (Technical or engineered material use); USES (Uses)
(catalyst support; fuel cell electrode comprising CO and sulfur tolerant metal compound hydrogen activation catalyst)
- IT 7439-88-5, Iridium, uses 7439-89-6,
Iron, uses 7439-98-7, Molybdenum, uses 7440-02-0,
Nickel, uses 7440-04-2, Osmium, uses 7440-05-3,
Palladium, uses 7440-06-4, Platinum, uses
7440-15-5, Rhenium, uses 7440-16-6,
Rhodium, uses 7440-18-8, Ruthenium, uses
7440-33-7, Tungsten, uses 7440-44-0D, Carbon, compound 7440-48-4
, Cobalt, uses 7440-50-8, Copper, uses 7704-34-9D, Sulfur,

compound 7782-49-2D, Selenium, compound
RL: CAT (Catalyst use); USES (Uses)
(fuel cell electrode comprising CO and sulfur tolerant metal
compound hydrogen activation catalyst)

IT 12166-20-0P, Ruthenium sulfide rus2
RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP
(Preparation); USES (Uses)
(fuel cell electrode comprising CO and sulfur tolerant metal
compound hydrogen activation catalyst)

IT 630-08-0, Carbon monoxide, miscellaneous 7704-34-9, Sulfur,
miscellaneous
RL: MSC (Miscellaneous)
(fuel cell electrode comprising CO and sulfur tolerant metal compound
hydrogen activation catalyst)

IT 1333-74-0, Hydrogen, uses 25067-58-7, Polyacetylene 25233-30-1,
Polyaniline 25233-34-5, Polythiophene 30604-81-0, Polypyrrole
RL: TEM (Technical or engineered material use); USES (Uses)
(fuel cell electrode comprising CO and sulfur tolerant metal compound
hydrogen activation catalyst)

IT 7782-42-5, Graphite, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(support; fuel cell electrode comprising CO and sulfur
tolerant metal compound hydrogen activation catalyst)

IT 7439-88-5, Iridium, uses 7439-89-6,
Iron, uses 7440-02-0, Nickel, uses
7440-05-3, Palladium, uses 7440-06-4,
Platinum, uses 7440-15-5, Rhenium, uses
7440-16-6, Rhodium, uses 7440-18-8,
Ruthenium, uses 7440-48-4, Cobalt, uses
RL: CAT (Catalyst use); USES (Uses)
(fuel cell electrode comprising CO and sulfur tolerant metal
compound hydrogen activation catalyst)

RN 7439-88-5 HCAPLUS
CN Iridium (8CI, 9CI) (CA INDEX NAME)

Ir

RN 7439-89-6 HCAPLUS
CN Iron (7CI, 8CI, 9CI) (CA INDEX NAME)

Fe

RN 7440-02-0 HCAPLUS
CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-05-3 HCAPLUS
CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-06-4 HCAPLUS
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-15-5 HCAPLUS
CN Rhenium (8CI, 9CI) (CA INDEX NAME)

Re

RN 7440-16-6 HCAPLUS
CN Rhodium (8CI, 9CI) (CA INDEX NAME)

Rh

RN 7440-18-8 HCAPLUS
CN Ruthenium (8CI, 9CI) (CA INDEX NAME)

Ru

RN 7440-48-4 HCAPLUS
CN Cobalt (8CI, 9CI) (CA INDEX NAME)

Co

IT 7782-42-5, Graphite, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(support; fuel cell electrode comprising CO and sulfur
tolerant metal compound hydrogen activation catalyst)
RN 7782-42-5 HCAPLUS
CN Graphite (8CI, 9CI) (CA INDEX NAME)

C

L82 ANSWER 9 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2004:513087 HCAPLUS
DN 141:57105
ED Entered STN: 25 Jun 2004
TI Catalytic material and electrode for fuel cell
IN Suzuki, Shuichi; Lee, Chahn; Satsu, Yuichi; Hidaka, Kishio; Hayashibara,
Mitsuo; Takamori, Yoshiyuki; Kamo, Tomoichi; Aono, Yasuhisa
PA Japan
SO U.S. Pat. Appl. Publ., 12 pp.
CODEN: USXXCO
DT Patent
LA English
IC ICM H01M004-96

ICS H01M004-90; B01J023-40; B01J023-74; B01J021-18
 INCL 429044000; 429040000; 502180000; 502185000
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2004121221	A1	20040624	US 2003-733385	20031212
	JP 2004207228	A2	20040722	JP 2003-394873	20031126
	US 2005142429	A1	20050630	US 2005-62597	20050222
PRAI	JP 2002-360100	A	20021212		
	US 2003-733385	A3	20031212		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
US 2004121221	ICM	H01M004-96
	ICS	H01M004-90; B01J023-40; B01J023-74; B01J021-18
	INCL	429044000; 429040000; 502180000; 502185000
US 2004121221	NCL	429/044.000
JP 2004207228	FTERM	5H018/AA07; 5H018/AS02; 5H018/AS03; 5H018/BB01; 5H018/BB06; 5H018/BB07; 5H018/BB08; 5H018/BB12; 5H018/BB13; 5H018/BB17; 5H018/DD08; 5H018/EE02; 5H018/EE03; 5H018/EE05; 5H018/EE08; 5H018/EE11; 5H018/EE16; 5H018/EE17; 5H026/AA08; 5H026/CX05; 5H026/EE02; 5H026/EE05; 5H026/EE18
US 2005142429	NCL	429/041.000

AB A catalytic material and electrode of the present invention are characterized in that the catalyst carrier constituting the above-mentioned catalytic material and electrode includes at least one member selected from the group consisting of nitrogen atoms, oxygen atoms, phosphor atoms, and sulfur atoms. Since the cohesion or growth of catalyst grains can hereby be suppressed, it is possible to provide a highly active catalyst, a high-performance electrode, and a high-output-d. fuel cell which uses the same.

ST fuel cell catalytic material electrode

IT Fuel cell electrodes

Fuel cells

(catalytic material and electrode for fuel cell)

IT Catalysts

(electrocatalysts; catalytic material and electrode for fuel cell)

IT 7439-88-5, Iridium, uses 7439-89-6,
 Iron, uses 7439-96-5, Manganese, uses
 7440-02-0, Nickel, uses 7440-05-3,
 Palladium, uses 7440-06-4, Platinum, uses
 7440-06-4D, Platinum, compound 7440-15-5,
 Rhenium, uses 7440-16-6, Rhodium, uses
 7440-18-8, Ruthenium, uses 7440-48-4,
 Cobalt, uses

RL: CAT (Catalyst use); USES (Uses)

(catalytic material and electrode for fuel cell)

IT 7704-34-9, Sulfur, uses 7723-14-0, Phosphorus
 , uses 7727-37-9, Nitrogen, uses 7782-44-7, Oxygen
 , uses

RL: MOA (Modifier or additive use); USES (Uses)

(catalytic material and electrode for fuel cell)

IT 7440-44-0, Carbon, uses

RL: CAT (Catalyst use); USES (Uses)

(support; catalytic material and electrode for fuel cell)

IT 7439-88-5, Iridium, uses 7439-89-6,
 Iron, uses 7439-96-5, Manganese, uses
 7440-02-0, Nickel, uses 7440-05-3,

Palladium, uses 7440-06-4, Platinum, uses
7440-06-4D, Platinum, compound 7440-15-5,
Rhenium, uses 7440-16-6, Rhodium, uses
7440-18-8, Ruthenium, uses 7440-48-4,
Cobalt, uses
RL: CAT (Catalyst use); USES (Uses)
(catalytic material and electrode for fuel cell)

RN 7439-88-5 HCAPLUS
CN Iridium (8CI, 9CI) (CA INDEX NAME)

Ir

RN 7439-89-6 HCAPLUS
CN Iron (7CI, 8CI, 9CI) (CA INDEX NAME)

Fe

RN 7439-96-5 HCAPLUS
CN Manganese (8CI, 9CI) (CA INDEX NAME)

Mn

RN 7440-02-0 HCAPLUS
CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-05-3 HCAPLUS
CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-06-4 HCAPLUS
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-06-4 HCAPLUS
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-15-5 HCAPLUS
CN Rhenium (8CI, 9CI) (CA INDEX NAME)

Re

RN 7440-16-6 HCAPLUS
CN Rhodium (8CI, 9CI) (CA INDEX NAME)

Rh

RN 7440-18-8 HCAPLUS
CN Ruthenium (8CI, 9CI) (CA INDEX NAME)

Ru

RN 7440-48-4 HCAPLUS
CN Cobalt (8CI, 9CI) (CA INDEX NAME)

Co

IT 7704-34-9, Sulfur, uses
RL: MOA (Modifier or additive use); USES (Uses)
(catalytic material and electrode for fuel cell)
RN 7704-34-9 HCAPLUS
CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

IT 7440-44-0, Carbon, uses
RL: CAT (Catalyst use); USES (Uses)
(support; catalytic material and electrode for fuel cell)
RN 7440-44-0 HCAPLUS
CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

L82 ANSWER 10 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2004:450603 HCAPLUS
DN 141:8868
ED Entered STN: 04 Jun 2004
TI Process for manufacture of nitrile compounds from ethylenically
unsaturated compounds
IN Galland, Jean Christophe; Didillon, Blaise; Marion, Philippe; Bourgeois,
Damien
PA Rhodia Polyamide Intermediates, Fr.
SO Fr. Demande, 24 pp.
CODEN: FRXXBL
DT Patent
LA French
IC ICM C07C255-04
ICS C07C253-10; C07F009-6584

CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
 Section cross-reference(s): 23, 67

FAN.CNT 1

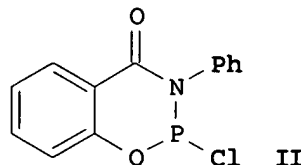
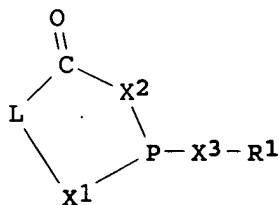
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	FR 2847898	A1	20040604	FR 2002-15115	20021202
	WO 2004060855	A1	20040722	WO 2003-FR3475	20031125
	W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW			
	RW:	BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
	EP 1567478	A1	20050831	EP 2003-789490	20031125
	R:	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK			
PRAI	FR 2002-15115	A	20021202		
	WO 2003-FR3475	W	20031125		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
FR 2847898	ICM	C07C255-04
	ICS	C07C253-10; C07F009-6584

OS CASREACT 141:8868; MARPAT 141:8868

GI



AB Nitriles are manufactured by hydrocyanation of ethylenically unsatd. compds. in liquid media in the presence of transition metal compds. and ligands I [X1, X2 = O or NR2, R2 = H, alkyl, aryl, sulfonyl, cycloalkyl, or carbonyl, X3 = covalent bond, O, or NR2, R1 = (heteroatom-containing) C1-12 alkyl or aromatic or cycloaliph. radical optionally substituted and optionally containing heteroatoms and ≥1 condensed or noncondensed ring, L = (heteroatom-containing) divalent C1-12 alkyl or divalent aromatic or cycloaliph. radical optionally substituted and optionally containing heteroatoms or ≥1 condensed or noncondensed ring]. The process is particularly useful for the synthesis of adiponitrile starting from butadiene. A typical I was manufactured by dropwise adding THF containing. 600 mg o-tert-butylphenol and 0.85 mL NEt3 to a THF-PhMe solution containing 1.1 g phosphorochloridite II at -10° with stirring and stirring the resulting suspension 18 h at 25°. thus, adiponitrile was prepared in 74% yield from 3-pentenitrile via cyanation with acetone cyanohydrin in the presence of I [R1 = o-tolyl, L = 1,2-phenylene, X1 = X3 = O, X2 = NPh], bis(1,5-cyclooctadiene)nickel and ZnCl2.

ST nitrile manuf unsatd compd hydrocyanation catalyst transition metal;

- phosphorus cyclic compd carbonyl catalyst hydrocyanation unsatd compd
- IT Isomerization
Isomerization catalysts
(isomerization of pentenenitriles in products mixts. from hydrocyanation of butadiene in presence of transition metal compds. and cyclic phosphorus compds.)
- IT Hydrocyanation
Hydrocyanation catalysts
(manufacture of nitrile compds. from ethylenically unsatd. compds. in presence of transition metal compds., cyclic phosphorus compds., and, optionally, Lewis acid cocatalysts in liquid media)
- IT Lewis acids
Transition metal compounds
RL: CAT (Catalyst use); USES (Uses)
(manufacture of nitrile compds. from ethylenically unsatd. compds. in presence of transition metal compds., cyclic phosphorus compds., and, optionally, Lewis acid cocatalysts in liquid media)
- IT 696664-75-2P
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(catalyst precursor; manufacture of nitrile compds. from ethylenically unsatd. compds. in presence of transition metal compds., cyclic phosphorus compds., and, optionally, Lewis acid cocatalysts)
- IT 88-18-6, o-tert-Butylphenol 91-40-7, N-Phenylanthranilic acid 95-48-7, o-Cresol, reactions 108-39-4, m-Cresol, reactions 15494-45-8
RL: RCT (Reactant); RACT (Reactant or reagent)
(catalyst precursor; manufacture of nitrile compds. from ethylenically unsatd. compds. in presence of transition metal compds., cyclic phosphorus compds., and, optionally, Lewis acid cocatalysts)
- IT 7646-85-7, Zinc chloride, uses
RL: CAT (Catalyst use); USES (Uses)
(cocatalyst; manufacture of nitrile compds. from ethylenically unsatd. compds. in presence of transition metal compds., cyclic phosphorus compds., and, optionally, Lewis acid cocatalysts)
- IT 7488-55-3, Stannous sulfate 7699-45-8, Zinc bromide 7772-99-8, Stannous chloride, uses 7773-01-5, Manganese chloride 7789-42-6, Cadmium bromide 10031-24-0, Stannous bromide 10108-64-2, Cadmium chloride 10139-47-6, Zinc iodide 13446-03-2, Manganese bromide 31186-57-9, Stannous tartarate 36554-90-2 128008-30-0
RL: CAT (Catalyst use); USES (Uses)
(cocatalyst; manufacture of nitrile compds. from ethylenically unsatd. compds. in presence of transition metal compds., cyclic phosphorus compds., and, optionally, Lewis acid cocatalysts in liquid media)
- IT 75-86-5, Acetone cyanohydrin
RL: RGT (Reagent); RACT (Reactant or reagent)
(cyanating agent; manufacture of nitrile compds. from ethylenically unsatd. compds. in presence of transition metal compds., cyclic phosphorus compds., and, optionally, Lewis acid cocatalysts in liquid media)
- IT 1295-35-8, Bis(1,5-cyclooctadiene)nickel
RL: CAT (Catalyst use); USES (Uses)
(manufacture of nitrile compds. from ethylenically unsatd. compds. in presence of transition metal compds., cyclic phosphorus compds., and, optionally, Lewis acid cocatalysts)
- IT 696664-71-8P 696664-72-9P 696664-73-0P 696664-74-1P 696664-76-3P 696664-77-4P
RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
(manufacture of nitrile compds. from ethylenically unsatd. compds. in presence of transition metal compds., cyclic phosphorus compds., and, optionally, Lewis acid cocatalysts)

IT 111-69-3P, Adiponitrile
RL: IMF (Industrial manufacture); PREP (Preparation)
(manufacture of nitrile compds. from ethylenically unsatd. compds. in presence of transition metal compds., cyclic phosphorus compds., and, optionally, Lewis acid cocatalysts)

IT 4635-87-4, 3-Pentenitrile
RL: RCT (Reactant); RACT (Reactant or reagent)
(manufacture of nitrile compds. from ethylenically unsatd. compds. in presence of transition metal compds., cyclic phosphorus compds., and, optionally, Lewis acid cocatalysts)

IT 7439-88-5D, Iridium, compds. 7439-89-6D, Iron, compds. 7439-97-6D, Mercury, compds. 7440-04-2D, Osmium, compds. 7440-05-3, Palladium, uses 7440-06-4D, Platinum, compds. 7440-16-6D, Rhodium, compds. 7440-18-8D, Ruthenium, compds. 7440-22-4D, Silver, compds. 7440-43-9D, Cadmium, compds. 7440-48-4D, Cobalt, compds. 7440-50-8D, Copper, compds. 7440-57-5D, Gold, compds. 7440-66-6D, Zinc, compds. 12266-58-9, Bis(acrylonitrile)nickel 14220-17-8, Potassium tetracyanonickelate 15133-82-1, Tetrakis(triphenylphosphine)nickel 696664-78-5
RL: CAT (Catalyst use); USES (Uses)
(manufacture of nitrile compds. from ethylenically unsatd. compds. in presence of transition metal compds., cyclic phosphorus compds., and, optionally, Lewis acid cocatalysts in liquid media)

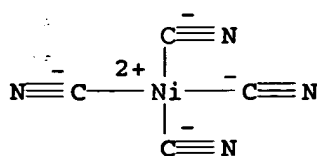
IT 4553-62-2P, 2-Methylglutaronitrile 17611-82-4P, 2-Ethylsuccinonitrile
RL: IMF (Industrial manufacture); PREP (Preparation)
(manufacture of nitrile compds. from ethylenically unsatd. compds. in presence of transition metal compds., cyclic phosphorus compds., and, optionally, Lewis acid cocatalysts in liquid media)

IT 78-79-5, Isoprene, reactions 100-42-5, Styrene, reactions 106-99-0, Butadiene, reactions 110-59-8, Valeronitrile 110-83-8, Cyclohexene, reactions 111-78-4, 1,5-Cyclooctadiene 592-42-7, 1,5-Hexadiene 592-51-8, 4-Pentenitrile 1335-86-0, Methylcyclohexene 4403-61-6, 2-Methyl-2-butenitrile 13284-42-9, 2-Pentenitrile 16529-56-9, 2-Methyl-3-butenitrile 25013-15-4, Methylstyrene 26588-32-9, Vinyl naphthalene
RL: RCT (Reactant); RACT (Reactant or reagent)
(manufacture of nitrile compds. from ethylenically unsatd. compds. in presence of transition metal compds., cyclic phosphorus compds., and, optionally, Lewis acid cocatalysts in liquid media)

RE.CNT 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
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(2) Le; WO 9530680 A 1995 HCAPLUS
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IT 14220-17-8, Potassium tetracyanonickelate
RL: CAT (Catalyst use); USES (Uses)
(manufacture of nitrile compds. from ethylenically unsatd. compds. in presence of transition metal compds., cyclic phosphorus compds., and, optionally, Lewis acid cocatalysts in liquid media)

RN 14220-17-8 HCAPLUS
CN Nickelate(2-), tetrakis(cyano-κC)-, dipotassium, (SP-4-1)- (9CI)
(CA INDEX NAME)

●2 K⁺

L82 ANSWER 11 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2004:1048396 HCAPLUS
 DN 142:201391
 ED Entered STN: 08 Dec 2004
 TI Carbon Nanostructures in Portable Fuel Cells: Single-Walled Carbon Nanotube Electrodes for Methanol Oxidation and Oxygen Reduction
 AU Girishkumar, G.; Vinodgopal, K.; Kamat, Prashant V.
 CS Radiation Laboratory, Department of Chemical and Biomolecular Engineering, University of Notre Dame, Notre Dame, IN, 46556-0579, USA
 SO Journal of Physical Chemistry B (2004), 108(52), 19960-19966
 CODEN: JPCBFK; ISSN: 1520-6106
 PB American Chemical Society
 DT Journal
 LA English
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 49
 AB The authors show here, for the 1st time, a reproducible way to obtain films of varying amts. of single-walled carbon nanotubes (SWCNTs) on electrode surfaces using electrophoretic deposition. The authors deposit these nanotubes in a facile manner on an optically transparent electrode (OTE) and study its performance as an electrode material in the presence of platinum for methanol oxidation and oxygen reduction. The focus here is on the deposition of the SWCNT on the electrodes, the characterization of the nanotubes on the electrode surface, and the cyclic voltammetry of methanol oxidation and oxygen reduction using these nanostructured carbon electrodes with platinum electrodeposited on them. The nanotubes retain their structure on the electrode surface, and the authors can obtain electrodes with relatively thick films of the CNTs. The high surface area and porosity of these films enable one to use relatively small amts. of platinum and yet obtain excellent currents. The authors see a remarkable enhancement in methanol oxidation current relative to unsupported platinum. Anal. of the electrode kinetics using Tafel plots suggests that the CNT support provides a strong electrocatalytic effect in both reactions arising from their unique elec. properties.
 ST carbon single walled nanotube methanol fuel cell transparent electrode
 IT Catalyst supports
 (carbon nanotube; use of carbon nanostructures in portable fuel cells and effect of single-walled carbon nanotube as catalyst support in electrodes for methanol oxidation and oxygen reduction)
 IT Nanotubes
 (carbon, single-walled; use of carbon nanostructures in portable fuel cells and effect of single-walled carbon nanotube as catalyst support in electrodes for methanol oxidation and oxygen reduction)
 IT Electric current

- (dependence on nanotube loading; use of carbon nanostructures in portable fuel cells and effect of single-walled carbon nanotube as catalyst support in electrodes for methanol oxidation and oxygen reduction)
- IT Electric current-potential relationship
(of assembled fuel cell under cyclic voltammetry; use of carbon nanostructures in portable fuel cells and effect of single-walled carbon nanotube as catalyst support in electrodes for methanol oxidation and oxygen reduction)
- IT Cyclic voltammetry
(of assembled fuel cells, supported and unsupported platinum; use of carbon nanostructures in portable fuel cells and effect of single-walled carbon nanotube as catalyst support in electrodes for methanol oxidation and oxygen reduction)
- IT Electrodeposition
(of platinum onto SWCNT film; use of carbon nanostructures in portable fuel cells and effect of single-walled carbon nanotube as catalyst support in electrodes for methanol oxidation and oxygen reduction)
- IT Adsorption
(of surfactant to SWCNT; use of carbon nanostructures in portable fuel cells and effect of single-walled carbon nanotube as catalyst support in electrodes for methanol oxidation and oxygen reduction)
- IT Films
(thick; use of carbon nanostructures in portable fuel cells and effect of single-walled carbon nanotube as catalyst support in electrodes for methanol oxidation and oxygen reduction)
- IT Electrodes
(transparent; use of carbon nanostructures in portable fuel cells and effect of single-walled carbon nanotube as catalyst support in electrodes for methanol oxidation and oxygen reduction)
- IT Electric conductors, glass
Electrode reaction kinetics
Electrophoretic deposition
Fuel cell electrodes
(use of carbon nanostructures in portable fuel cells and effect of single-walled carbon nanotube as catalyst support in electrodes for methanol oxidation and oxygen reduction)
- IT 7440-44-0, Carbon, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(nanotubes; use of carbon nanostructures in portable fuel cells and effect of single-walled carbon nanotube as catalyst support in electrodes for methanol oxidation and oxygen reduction)
- IT 14866-33-2, Tetraoctylammonium bromide
RL: MOA (Modifier or additive use); USES (Uses)
(surfactant; use of carbon nanostructures in portable fuel cells and effect of single-walled carbon nanotube as catalyst support in electrodes for methanol oxidation and oxygen reduction)
- IT 7440-06-4P, Platinum, uses
RL: CAT (Catalyst use); DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(use of carbon nanostructures in portable fuel cells and effect of single-walled carbon nanotube as catalyst support in electrodes for methanol oxidation and oxygen reduction)
- IT 67-56-1, Methanol, uses
RL: CPS (Chemical process); PEP (Physical, engineering or chemical

process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(use of carbon nanostructures in portable fuel cells and effect of single-walled carbon nanotube as catalyst support in electrodes for methanol oxidation and oxygen reduction)

IT 7664-93-9, Sulfuric acid, uses

RL: DEV (Device component use); USES (Uses)

(use of carbon nanostructures in portable fuel cells and effect of single-walled carbon nanotube as catalyst support in electrodes for methanol oxidation and oxygen reduction)

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IT 7440-06-4P, Platinum, uses
RL: CAT (Catalyst use); DEV (Device component use); SPN
(Synthetic preparation); PREP (Preparation); USES (Uses)
(use of carbon nanostructures in portable fuel cells and effect of
single-walled carbon nanotube as catalyst
support in electrodes for methanol oxidation and oxygen reduction)
RN 7440-06-4 HCAPLUS
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

L82 ANSWER 12 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2004:577891 HCAPLUS
DN 141:369298
ED Entered STN: 20 Jul 2004
TI The role of phosphorus in the growth of vapour-grown carbon fibres
obtained by catalytic decomposition of hydrocarbons
AU Benissad-Aissani, F.; Aiet-Amar, H.; Schouler, M.-C.; Gadelle, P.
CS CNRS-INPG-UJF, Ecole Nationale Supérieure d'Electrochimie et
d'electrometallurgie de Grenoble, Laboratoire de Thermodynamique et
Physico-chimie Metallurgiques, Saint Martin d'Heres, 38402, Fr.
SO Carbon (2004), 42(11), 2163-2168
CODEN: CRBNAH; ISSN: 0008-6223
PB Elsevier Science Ltd.
DT Journal
LA English
CC 57-8 (Ceramics)
Section cross-reference(s): 78
AB Production of VGCF fibers from the decomposition of a methane-hydrogen mixture over
metal particles is influenced by the support on which the particles have
been laid. It was found that different as-received com. graphite
supports, according to their impurity content, could promote or
inhibit the VGCF growth. Good yields of vapor-grown carbon fibers with a
length ≤ 6 cm have been fabricated by catalytic decomposition of methane
over particles obtained from $\text{Fe}_3(\text{CO})_{12}$. Addition to the substrate of small
amts. of phosphorus from a solution of H_3PO_4 in ethanol, followed by
impregnation with $\text{Fe}_3(\text{CO})_{12}$, was found to be effective in promoting the
growth of VGCFs and increasing the yield. But increasing the amount of
phosphorus over P/Fe .apprx.0.25 had an inhibiting effect on the growth of
VGCFs. So the yield of VGCFs was optimized for a given phosphorus concentration
These phenomena are interpreted by the formation of Fe-P compds. which,
depending on their formulas, lower or increase the m.p. of the catalyst
particles. According to the VLS theory, catalytic growth up to a
macroscopic scale results from the liquid state of the catalyst.
ST carbon fiber vapor growth graphite substrate phosphorus impurity
IT Decomposition
(catalytic; effects of phosphorus doping of graphite substrate on the
growth of vapor-grown carbon fibers by catalytic decomposition of
hydrocarbons)
IT Vapor deposition process
(chemical, catalytic; effects of phosphorus doping of graphite substrate
on the growth of vapor-grown carbon fibers by catalytic decomposition of

- hydrocarbons)
- IT Carbon fibers, preparation
RL: SPN (Synthetic preparation); PREP (Preparation)
(vapor-grown; effects of phosphorus doping of graphite substrate on the growth of vapor-grown carbon fibers by catalytic decomposition of hydrocarbons)
- IT 7723-14-0, Phosphorus, uses
RL: MOA (Modifier or additive use); USES (Uses)
(CVD substrate dopant; effects of phosphorus doping of graphite substrate on the growth of vapor-grown carbon fibers by catalytic decomposition of hydrocarbons)
- IT 7782-42-5, Graphite, properties
RL: NUU (Other use, unclassified); PRP (Properties); USES (Uses)
(CVD substrate; effects of phosphorus doping of graphite substrate on the growth of vapor-grown carbon fibers by catalytic decomposition of hydrocarbons)
- IT 74-82-8, Methane, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(carbon source; effects of phosphorus doping of graphite substrate on the growth of vapor-grown carbon fibers by catalytic decomposition of hydrocarbons)
- IT 17685-52-8, Iron, di- μ -carbonyldecacarbonyltri-, triangulo
RL: CAT (Catalyst use); CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(catalyst precursor; effects of phosphorus doping of graphite substrate on the growth of vapor-grown carbon fibers by catalytic decomposition of hydrocarbons)
- IT 7439-89-6, Iron, uses
RL: CAT (Catalyst use); USES (Uses)
(catalyst; effects of phosphorus doping of graphite substrate on the growth of vapor-grown carbon fibers by catalytic decomposition of hydrocarbons)
- IT 7664-38-2, Phosphoric acid, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(phosphorus precursor; effects of phosphorus doping of graphite substrate on the growth of vapor-grown carbon fibers by catalytic decomposition of hydrocarbons)

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IT 7439-89-6, Iron, uses
RL: CAT (Catalyst use); USES (Uses)
(catalyst; effects of phosphorus doping of graphite substrate on the growth of vapor-grown carbon fibers by catalytic decomposition of hydrocarbons)
RN 7439-89-6 HCAPLUS
CN Iron (7CI, 8CI, 9CI) (CA INDEX NAME)

Fe

L82 ANSWER 13 OF 62 COMPENDEX COPYRIGHT 2005 EEI on STN
AN 2004(48):3441 COMPENDEX
TI Catalyst separation in atom transfer radical polymerization.
AU Shen, Youqing (Department of Chemical Engineering University of Wyoming, Laramie, WY 82071, United States); Tang; Huadong; Ding, Shijie
SO Progress in Polymer Science (Oxford) v 29 n 10 October 2004 2004.p 1053-1078
CODEN: PRPSB8 ISSN: 0079-6700
PY 2004
DT Journal
TC Bibliography; Theoretical
LA English
AB Atom transfer radical polymerization (ATRP) is a living radical polymerization process utilizing transition-metal complexes as catalysts to mediate the propagation of the polymerization. It is a very versatile process and can synthesize a wide spectrum of polymers with controlled structures. However, a high concentration of soluble catalyst is required in the ATRP process. These catalysts generally co-precipitate in the products as contaminants. Thus, a remaining challenge in ATRP is how to efficiently and economically remove/reduce the catalyst residue from its products, especially for large-scale industrial productions. Post-purification such as reprecipitation, washing, adsorbing with ion-exchange resins, and passing columns of alumina or silica gel has been used on small lab scales. Biphasic catalysis of liquid-liquid biphasic (fluorocarbon-organic solvents; ionic liquid-organic solvents) and liquid-solid biphasic (solid phase ATRP, solid-supported catalysts by physical adsorption and by covalent bonding, soluble/recoverable supported catalysts, immobilized/soluble hybrid system) has been explored for ATRP. In spite of the advantages of easy catalyst separation/recovery and possibility of scaling up, its control over the polymerization generally deteriorates compared with homogeneous catalysis. Finally, a reversible catalyst supporting concept that is homogeneous for catalysis but heterogeneous for separation/recovery is presented. The development and characters of each system are critically

reviewed. \$CPY 2004 Elsevier Ltd. All rights reserved. 124 Refs.

CC 815.2 Polymerization; 531 Metallurgy and Metallography; 803 Chemical Agents; 804 Chemical Products Generally; 802.3 Chemical Operations; 815.1 Polymeric Materials

CT *Polymerization; Silica gel; Purification; Graft copolymers; Couplings; Hydrogen bonds; Optimization; Transition metals; Catalysts

ST Atom transfer radical polymerization (ATRP); Catalyst separation; Catalyst supporting; Heterogeneous agents

L82 ANSWER 14 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2004:99420 HCAPLUS

DN 140:357499

ED Entered STN: 06 Feb 2004

TI Ligand properties of aromatic azines: C-H activation, metal induced disproportionation and catalytic C-C coupling reactions

AU Donnecke, Daniel; Wunderle, Joachim; Imhof, Wolfgang

CS Institut fur Anorganische und Analytische Chemie der Friedrich-Schiller, Universitat Jena, Jena, 07743, Germany

SO Journal of Organometallic Chemistry (2004), 689(3), 585-594
CODEN: JORCAI; ISSN: 0022-328X

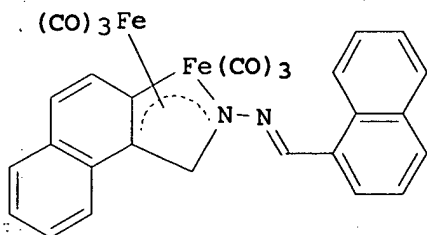
PB Elsevier Science B.V.

DT Journal

LA English

CC 29-14 (Organometallic and Organometalloidal Compounds)
Section cross-reference(s): 75

GI



I

AB The reaction of aromatic azines with $\text{Fe}_2(\text{CO})_9$ yields dinuclear Fe carbonyl cluster compds., e.g., I, as the main products. The formation of these compds. may be rationalized by a C-H activation reaction at the aromatic substituent in ortho position with respect to the exocyclic C-N double bond followed by an intramol. shift of the corresponding H atom toward the former imine C atom. The 2nd imine function of the ligand does not react. Addnl. products arise from the metal induced disproportionation of the azine into a primary imine and a nitrile. So also one of the imine C-H bonds may be activated during the reaction. Depending on the aromatic substituent of the azine ligands Fe carbonyl complexes of the disproportionation products are isolated and characterized by x-ray crystallog. C-C coupling reactions catalyzed by $\text{Ru}_3(\text{CO})_{12}$ gave ortho-substituted azines. Ortho-substituted nitriles are identified as side-products showing that the metal induced disproportionation reaction also takes place under catalytic conditions.

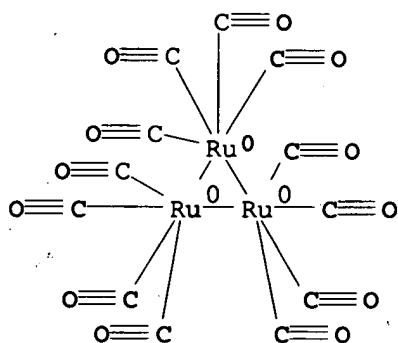
- ST ruthenium catalyst carbon carbon coupling reaction azine ethene;
azaferrocyclopentadiene azatriiron tetrahedron carbonyl cluster prep
crystal mol structure; azine arom hydrocarbon bond activation insertion
reaction iron carbonyl
- IT Disproportionation
(C-H activation reactions of aromatic azines with nonacarbonyldiiron to
give Fe carbonyl cluster compds.)
- IT Azines
RL: RCT (Reactant); RACT (Reactant or reagent)
(C-H activation reactions of aromatic azines with nonacarbonyldiiron to
give Fe carbonyl cluster compds.)
- IT Cluster compounds
RL: SPN (Synthetic preparation); PREP (Preparation)
(C-H activation reactions of aromatic azines with nonacarbonyldiiron to
give Fe carbonyl cluster compds.)
- IT Bond
(carbon-hydrogen, activation; C-H activation reactions of aromatic azines
with nonacarbonyldiiron to give Fe carbonyl cluster compds.)
- IT Crystal structure
Molecular structure
(of azaferrocyclopentadiene derivs. and azatriiron tetrahedron carbonyl
cluster)
- IT Coupling reaction
Coupling reaction catalysts
(ruthenium-catalyzed C-C coupling reactions of aromatic azines with ethene
to give ortho-substituted azines)
- IT 15321-51-4, Nonacarbonyldiiron 41097-39-6 41097-47-6 65997-91-3
681285-58-5
RL: RCT (Reactant); RACT (Reactant or reagent)
(C-H activation reactions of aromatic azines with nonacarbonyldiiron to
give Fe carbonyl cluster compds.)
- IT 86-53-3P, 1-Naphthalenecarbonitrile 80995-56-8P 103408-11-3P
681285-59-6P 681285-62-1P 681285-66-5P
RL: SPN (Synthetic preparation); PREP (Preparation)
(C-H activation reactions of aromatic azines with nonacarbonyldiiron to
give Fe carbonyl cluster compds.)
- IT 681285-60-9P 681285-61-0P 681285-63-2P 681285-64-3P 681285-65-4P
681285-67-6P
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(crystal structure; C-H activation reactions of
aromatic azines with nonacarbonyldiiron to give Fe carbonyl cluster
compds.)
- IT 15243-33-1, Dodecacarbonyltriruthenium
RL: CAT (Catalyst use); USES (Uses)
(ruthenium-catalyzed C-C coupling reactions of aromatic azines with ethene
to give ortho-substituted azines)
- IT 74-85-1, Ethene, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(ruthenium-catalyzed C-C coupling reactions of aromatic azines with ethene
to give ortho-substituted azines)

RE.CNT 38 THERE ARE 38 CITED REFERENCES AVAILABLE FOR THIS RECORD

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 IT 15243-33-1, Dodecacarbonyltriruthenium
 RL: CAT (Catalyst use); USES (Uses)
 (ruthenium-catalyzed C-C coupling reactions of aromatic azines with ethene to give ortho-substituted azines)
 RN 15243-33-1 HCAPLUS
 CN Ruthenium, dodecacarbonyltri-, triangulo (9CI) (CA INDEX NAME)



L82 ANSWER 15 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2004:424733 HCAPLUS
 DN 141:143164
 ED Entered STN: 26 May 2004
 TI Local structure around platinum in Pt/C catalysts employed for liquid-phase dehydrogenation of decalin in the liquid-film state under

- reactive distillation conditions
- AU Shinohara, Chiaki; Kawakami, Satoshi; Moriga, Toshihiro; Hayashi, Hiromu; Hodoshima, Shinya; Saito, Yasukazu; Sugiyama, Shigeru
- CS Faculty of Engineering, Department of Chemical Science and Technology, University of Tokushima, Minamijosanjima, Tokushima, 770-8506, Japan
- SO Applied Catalysis, A: General (2004), 266(2), 251-255
CODEN: ACAGE4; ISSN: 0926-860X
- PB Elsevier Science B.V.
- DT Journal
- LA English
- CC 52-3 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 48, 67, 75
- AB The dehydrogenation of decalin to naphthalene in the liquid-film state was studied on Pt/C catalysts under reactive distillation conditions at 483 °K. The catalysts were prepared from the following three procedures: (1) Pt/C with active carbon pretreated with aqueous NaOH solution, followed by NaBH₄ reduction; (2) Pt/C with the NaOH-pretreated active carbon, followed by H₂ reduction; (3) Pt/C with the support but not-pretreated with NaOH, followed by NaBH₄ reduction. The highest activity for evolution of hydrogen from the dehydrogenation of decalin to naphthalene was observed on Pt/C prepared using the procedure (1). The employment of H₂ reduction and the support not-pretreated with NaOH afforded lower activities. Extended x-ray absorption fine structure (XAFS) analyses revealed that the nature of platinum was strongly influenced by both the NaOH-treatment and the reduction procedures. The nearest-neighbor distance of Pt-Pt in the active catalyst was evidently shorter than those in metallic platinum and in the catalyst prepared from the support not-pretreated with the NaOH solution, while it was longer than the catalyst prepared from the employment of H₂-reduction for NaBH₄-reduction. However, the distances in those catalysts prepared in the present study were longer than those of Pt²⁺ and Pt⁴⁺. The high dispersion of Pt, which is established with the employment of NaBH₄-reduction and the support pretreated with NaOH, affords a more covalent nature for the platinum species, resulting in the highest activities for the dehydrogenation of decalin to naphthalene.
- ST structure EXAFS platinum catalyst liq phase dehydrogenation decalin; reactive distn decalin naphthalene fuel cell hydrogen storage XANES; short interatomic distance platinum coordination catalyst hydrogen regeneration.
- IT **Bond**
(covalent, proposed for some Pt species in catalyst type (3); local structure around platinum in Pt/C catalysts employed for liquid-phase dehydrogenation of decalin in liquid-film state under reactive distillation conditions)
- IT Dehydrogenation catalysts
(for decalin; local structure around platinum in Pt/C catalysts employed for liquid-phase dehydrogenation of decalin in liquid-film state under reactive distillation conditions)
- IT Fuel cells
(hydrogen storage/supply for; local structure around platinum in Pt/C catalysts employed for liquid-phase dehydrogenation of decalin in liquid-film state under reactive distillation conditions)
- IT Bond length
(interat. distances between Pt, Pt²⁺, and Pt⁴⁺; local structure around platinum in Pt/C catalysts employed for liquid-phase dehydrogenation of decalin in liquid-film state under reactive distillation conditions)
- IT Dehydrogenation
(local structure around platinum in Pt/C catalysts employed for liquid-phase dehydrogenation of decalin in liquid-film state under reactive distillation conditions)
- IT Surface area
(of Pt/C catalysts; local structure around platinum in Pt/C catalysts

employed for liquid-phase dehydrogenation of decalin in liquid-film state under reactive distillation conditions)

IT Coordination number

(pf Pt atoms in catalysts; local structure around platinum in Pt/C catalysts employed for liquid-phase dehydrogenation of decalin in liquid-film state under reactive distillation conditions)

IT Reaction

(with distillation; local structure around platinum in Pt/C catalysts employed for liquid-phase dehydrogenation of decalin in liquid-film state under reactive distillation conditions)

IT Distillation

(with reaction; local structure around platinum in Pt/C catalysts employed for liquid-phase dehydrogenation of decalin in liquid-film state under reactive distillation conditions)

IT 7440-44-0, Carbon, uses

RL: CAT (Catalyst use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)

(activated, active support; local structure around platinum in Pt/C catalysts employed for liquid-phase dehydrogenation of decalin in liquid-film state under reactive distillation conditions)

IT 1310-73-2, Sodium hydroxide (NaOH), reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(catalyst pretreatment; local structure around platinum in Pt/C catalysts employed for liquid-phase dehydrogenation of decalin in liquid-film state under reactive distillation conditions)

IT 1333-74-0P, Hydrogen, preparation

RL: ANT (Analyte); IMF (Industrial manufacture); RCT (Reactant); ANST (Analytical study); PREP (Preparation); RACT (Reactant or reagent)

(catalyst reduction; local structure around platinum in Pt/C catalysts employed for liquid-phase dehydrogenation of decalin in liquid-film state under reactive distillation conditions)

IT 16940-66-2, Sodium borohydride (NaBH₄)

RL: RCT (Reactant); RACT (Reactant or reagent)

(catalyst reduction; local structure around platinum in Pt/C catalysts employed for liquid-phase dehydrogenation of decalin in liquid-film state under reactive distillation conditions)

IT 7440-06-4P, Platinum, uses

RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

(local structure around platinum in Pt/C catalysts employed for liquid-phase dehydrogenation of decalin in liquid-film state under reactive distillation conditions)

IT 91-20-3P, Naphthalene, preparation

RL: IMF (Industrial manufacture); PREP (Preparation)

(local structure around platinum in Pt/C catalysts employed for liquid-phase dehydrogenation of decalin in liquid-film state under reactive distillation conditions)

IT 91-17-8, Decalin

RL: RCT (Reactant); RACT (Reactant or reagent)

(local structure around platinum in Pt/C catalysts employed for liquid-phase dehydrogenation of decalin in liquid-film state under reactive distillation conditions)

IT 10025-99-7, Potassium tetrachloroplatinate

RL: PEP (Physical, engineering or chemical process); PYP (Physical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)

(precursor; local structure around platinum in Pt/C catalysts employed for liquid-phase dehydrogenation of decalin in liquid-film state under reactive distillation conditions)

RE.CNT 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD

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IT

7440-44-0, Carbon, uses

RL: CAT (Catalyst use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)

(activated, active support; local structure around platinum in Pt/C catalysts employed for liquid-phase dehydrogenation of decalin in liquid-film state under reactive distillation conditions)

RN

7440-44-0 HCAPLUS

CN

Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

IT

7440-06-4P, Platinum, uses

RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

(local structure around platinum in Pt/C catalysts employed for liquid-phase dehydrogenation of decalin in liquid-film state under reactive distillation conditions)

RN

7440-06-4 HCAPLUS

CN

Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

L82 ANSWER 16 OF 62 COMPENDEX COPYRIGHT 2005 EEI on STN

AN 2004(52):3587 COMPENDEX

TI Design and application of amphiphilic polymeric supports for micellar catalysis.

AU Kotre, Thomas (Lehrst. F. Makromolekulare Stoffe TU Munchen, D-85747 Garching, Germany); Zarka, M. Tobias; Krause, Jens O.; Buchmeiser, Michael R.; Weberskirch, Ralf; Nuyken, Oskar

SO Macromolecular Symposia v 217 October 2004 2004.p 203-214

CODEN: MSYMEC ISSN: 1022-1360

PY 2004

DT Journal

TC Experimental

LA English

AB In this contribution, the synthesis and application of amphiphilic poly(2-oxazoline)s with covalently bound transition metal catalysts for reactions in aqueous media is described. In the first example, bipyridine moieties were introduced via living ring-opening

polymerization of functionalized oxazoline monomers and the resulting block copolymers were used as macroligands for ATRP (atom transfer radical polymerization) using Cu(I)Br as active metal species. Furthermore, the fixation of a chiral biphosphane and its use for enantioselective hydrogenation of enamides is presented as well as the fixation of a ruthenium catalyst. The latter one is used for polymerization of diethyl dipropargylmalonate (DEDPM), and represents the first example of an alkyne polymerization using a ruthenium catalyst. In the case of the polymers stable latex particles were obtained. 18 Refs.

CC 815.1 Polymeric Materials; 801.3 Colloid Chemistry; 802.2 Chemical Reactions; 801.4 Physical Chemistry; 815.2 Polymerization; 547.1 Precious Metals
CT *Block copolymers; Chemical bonds; Ring opening polymerization; Synthesis (chemical); Ruthenium; Catalysts; Hydrogenation; Micelles
ST Covalent bonds; Amphiphilicity; Latex
ET Br

L82 ANSWER 17 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2004:245263 HCAPLUS

DN 141:90848

ED Entered STN: 25 Mar 2004

TI Rhodium-diphosphine complex bound to activated carbon. An effective catalyst for the hydroformylation of 1-octene

AU Roman-Martinez, M. Carmen; Diaz-Aunon, Jose A.; Salinas-Martinez de Lecea, Concepcion; Alper, Howard

CS Departamento de Quimica Inorganica, Universidad de Alicante, Alicante, 03080, Spain

SO Journal of Molecular Catalysis A: Chemical (2004), 213(2), 177-182
CODEN: JMCCF2; ISSN: 1381-1169

PB Elsevier Science B.V.

DT Journal

LA English

CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)

Section cross-reference(s): 23, 67

OS CASREACT 141:90848

AB A rhodium(I) diphosphine complex was anchored on an activated carbon by means of a covalent bond and then it has been tested as catalyst for the hydroformylation of 1-octene. The heterogenization procedure includes the functionalization of the carbon surface to create acid chloride groups where an esterification reaction with the hydroxyl end of a diphosphine ligand (HONP) can take place. Two strategies have been followed: route I: ligand anchorage followed by complex formation (using the $[\text{Rh}(\mu\text{-Cl})(\text{COD})]_2$ complex as precursor) and route II: synthesis of the rhodium diphosphine complex $[\text{Rh}(\text{HONP})(\text{COD})]\text{Cl}$ followed by anchorage on the functionalized carbon support. The solid samples, functionalized activated carbon and anchored complexes, have been characterized by XPS and ^{31}P NMR. The two synthetic routes render catalysts that are active, selective and stable enough to be used in consecutive catalytic runs. The catalyst prepared by route II shows an outstanding behavior, being fully active and with almost constant selectivity to the linear aldehyde in four consecutive catalytic runs.

ST rhodium diphosphine complex bound activated carbon hydroformylation catalyst octene

IT Binding energy

Hydroformylation

Hydroformylation catalysts

(preparation and characterization of rhodium-diphosphine complex bound to activated carbon as effective catalyst for hydroformylation of octene)

IT Aldehydes, preparation

RL: IMF (Industrial manufacture); PREP (Preparation)

- (preparation and characterization of rhodium-diphosphine complex bound to activated carbon as effective catalyst for hydroformylation of octene)
- IT 7440-44-0DP, Norit GF 45, oxidized and chlorinated, reaction products with rhodium-diphosphine complexes
RL: CAT (Catalyst use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(activated; preparation and characterization of rhodium-diphosphine complex bound to activated carbon as effective catalyst for hydroformylation of octene)
- IT 111-67-1P, 2-Octene
RL: BYP (Byproduct); PREP (Preparation)
(preparation and characterization of rhodium-diphosphine complex bound to activated carbon as effective catalyst for hydroformylation of octene)
- IT 535926-13-7DP, reaction products with chlorinated carbon
RL: CAT (Catalyst use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(preparation and characterization of rhodium-diphosphine complex bound to activated carbon as effective catalyst for hydroformylation of octene)
- IT 7786-29-0, Octanal, 2-methyl- 124-19-6P, Nonanal
RL: IMF (Industrial manufacture)
(preparation and characterization of rhodium-diphosphine complex bound to activated carbon as effective catalyst for hydroformylation of octene)
- IT 50-00-0, Formaldehyde, reactions 111-66-0, 1-Octene 829-85-6, Diphenylphosphine 12092-47-6, Di- μ -chlorobis(cyclooctadiene)dirhodium
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation and characterization of rhodium-diphosphine complex bound to activated carbon as effective catalyst for hydroformylation of octene)
- IT 535926-12-6P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and characterization of rhodium-diphosphine complex bound to activated carbon as effective catalyst for hydroformylation of octene)

RE.CNT 26 THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE

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L82 ANSWER 18 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2003:133188 HCAPLUS

DN 138:172784

ED Entered STN: 21 Feb 2003

TI Synthesis of hydrogen peroxide from oxygen and hydrogen using a catalyst

IN Papparatto, Giuseppe; De Alberti, Giordano; D'Aloisio, Rino; Buzzoni, Roberto

PA ENI S.p.A., Italy; Polimeri Europa S.p.A.

SO PCT Int. Appl., 31 pp.

CODEN: PIXXD2

DT Patent

LA English

IC ICM C01B015-00

CC 49-3 (Industrial Inorganic Chemicals)

Section cross-reference(s): 45, 67

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI WO 2003014014	A2	20030220	WO 2002-EP8546	20020730
WO 2003014014	A3	20030717		
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW			
RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
CA 2455335	AA	20030220	CA 2002-2455335	20020730
EP 1412287	A2	20040428	EP 2002-767292	20020730
R:	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK			
JP 2004537410	T2	20041216	JP 2003-518974	20020730
NO 2004000435	A	20040402	NO 2004-435	20040130
US 2004184983	A1	20040923	US 2004-485629	20040130
PRAI IT 2001-MI1688	A	20010802		
WO 2002-EP8546	W	20020730		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
WO 2003014014	ICM	C01B015-00
WO 2003014014	ECLA	B01J021/18; B01J023/40; B01J023/44; B01J031/06; C01B015/029
JP 2004537410	FTERM	4G069/AA03; 4G069/AA08; 4G069/BA01A; 4G069/BA02A; 4G069/BA03A; 4G069/BA07A; 4G069/BA08A; 4G069/BA08B; 4G069/BA21C; 4G069/BA22A; 4G069/BA22B; 4G069/BB02A; 4G069/BB02B; 4G069/BC69A; 4G069/BC70A; 4G069/BC71A; 4G069/BC72A; 4G069/BC72B; 4G069/BC74A; 4G069/BC75A; 4G069/BC75B; 4G069/BE02A; 4G069/BE02B; 4G069/BE22C; 4G069/CB81; 4G069/EC03X; 4G069/EC03Y; 4G069/EC04X; 4G069/EC04Y; 4G069/FA03; 4G069/FB19; 4G069/FC04; 4G069/FC08
US 2004184983	NCL	423/584.000
	ECLA	B01J021/18; B01J023/40; B01J023/44; B01J031/06; C01B015/029

AB A catalyst useful for the synthesis of hydrogen peroxide starting from

hydrogen and oxygen consists of at least one metal of the platinum group as active component, a polyolefin, and a carrier. The catalyst contains 0.05-2 weight% of Pd, 0.005-0.5 weight% of Pt with an atomic ratio of Pt/Pd of (1-30)/(70-99), and optionally Ru, Rh, Ir, and Au. The polyolefins can be rubbers and copolymers of butadiene-styrene (synthetic rubber; GRS, SBR); ethylenepropylene (EPM, EPR) copolymers, ethylenepropylenediene copolymers (EPDM rubbers), styrene-butadiene-styrene (SBR thermoplastic rubbers); isobutylene isoprene rubber (butylrubbers). The carrier can be silica, alumina, silica-alumina, zeolites, and preferably activated carbon or activated carbon functionalized with sulfonic groups with a surface area of > 600 m²/g. The catalyst is prepared by dispersing the precursors of the single metal components on an inert carrier which can be pretreated with a polyolefin by precipitation or impregnation. The reaction solvent contains a halogenated promoter, such as HBr, NaBr, KBr, or NH₄Br, and/or an acid promoter, such as sulfuric, phosphoric, nitric acid or sulfonic acids. The solvent consists of at least one alc. or a mixture of alc.-water optionally containing an aliphatic ether and/or one or more C₅-32 hydrocarbons. The alc. can be ethanol, tert. butanol, or preferably methanol. The ether is Me tert-Bu ether. The hydrocarbon is selected from paraffins, such as n-hexane, n-heptane, n-octane, and n-decane, cyclo-paraffinic hydrocarbons, such as cyclohexane, decalin, methylcyclohexane, ethylcyclohexane and dimethylcyclohexane, aromatic hydrocarbons, such as benzene, naphthalene, toluene, xylenes, ethylbenzene, cumene, and alkyl naphthalenes. The reaction is carried out at 20-40°C, 30-100 bars, and in the presence of an inert gas, such as N₂, He, or Ar. The produced hydrogen peroxide solution can be directly used in an oxidation process of a substrate, e.g. olefins, aromatic hydrocarbons, ammonia, and carbonyl compds., catalyzed by titanium silicalite.

- ST hydrogen peroxide prodn oxygen oxidn catalyst polyolefin transition metal;
hydrocarbon oxidn hydrogen peroxide titanium silicalite catalyst
- IT Sulfonic acids, uses
RL: NUU (Other use, unclassified); USES (Uses)
(acid promoter; synthesis of hydrogen peroxide from oxygen and hydrogen using catalyst)
- IT Isoprene-styrene rubber
RL: CAT (Catalyst use); USES (Uses)
(block; synthesis of hydrogen peroxide from oxygen and hydrogen using catalyst)
- IT Zeolites (synthetic), uses
RL: CAT (Catalyst use); USES (Uses)
(catalyst support; synthesis of hydrogen peroxide from oxygen and hydrogen using catalyst)
- IT Isoprene-styrene rubber
RL: CAT (Catalyst use); USES (Uses)
(hydrogenated, block; synthesis of hydrogen peroxide from oxygen and hydrogen using catalyst)
- IT Alkenes, reactions
Carbonyl compounds (organic), reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(oxidation of; synthesis of hydrogen peroxide from oxygen and hydrogen using catalyst)
- IT Aromatic hydrocarbons, reactions
RL: MOA (Modifier or additive use); NUU (Other use, unclassified); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(solvent, oxidation of; synthesis of hydrogen peroxide from oxygen and hydrogen using catalyst)
- IT Alkanes, uses
RL: MOA (Modifier or additive use); NUU (Other use, unclassified); USES (Uses)
(solvent; synthesis of hydrogen peroxide from oxygen and

- hydrogen using catalyst)
- IT Alcohols, uses
RL: NUU (Other use, unclassified); USES (Uses)
(solvent; synthesis of hydrogen peroxide from oxygen and hydrogen using catalyst)
- IT Oxidation catalysts
(synthesis of hydrogen peroxide from oxygen and hydrogen using catalyst)
- IT Butyl rubber, uses
EPDM rubber
Ethylene-propylene rubber
Isoprene rubber, uses
Polyolefin rubber
Polyolefins
Styrene-butadiene rubber, uses
Titanium silicalite
RL: CAT (Catalyst use); USES (Uses)
(synthesis of hydrogen peroxide from oxygen and hydrogen using catalyst)
- IT 7664-38-2, Phosphoric acid, uses 7664-93-9, Sulfuric acid, uses
7697-37-2, Nitric acid, uses
RL: NUU (Other use, unclassified); USES (Uses)
(acid promoter; synthesis of hydrogen peroxide from oxygen and hydrogen using catalyst)
- IT 9010-85-9
RL: CAT (Catalyst use); USES (Uses)
(butyl rubber, synthesis of hydrogen peroxide from oxygen and hydrogen using catalyst)
- IT 1344-28-1, Alumina, uses 7440-44-0, Carbon, uses
7440-44-0D, Carbon, functionalized with sulfonic groups 7631-86-9,
Silica, uses 159995-97-8, Aluminum silicon oxide
RL: CAT (Catalyst use); USES (Uses)
(catalyst support; synthesis of hydrogen peroxide from oxygen and hydrogen using catalyst)
- IT 9010-79-1
RL: CAT (Catalyst use); USES (Uses)
(ethylene-propylene rubber, synthesis of hydrogen peroxide from oxygen and hydrogen using catalyst)
- IT 7647-15-6, Sodium bromide (NaBr), uses 7758-02-3, Potassium bromide (KBr), uses 10035-10-6, Hydrogen bromide, uses 12124-97-9, Ammonium bromide (NH4Br)
RL: NUU (Other use, unclassified); USES (Uses)
(halogenated promoter; synthesis of hydrogen peroxide from oxygen and hydrogen using catalyst)
- IT 9003-31-0
RL: CAT (Catalyst use); USES (Uses)
(isoprene rubber, synthesis of hydrogen peroxide from oxygen and hydrogen using catalyst)
- IT 105729-79-1
RL: CAT (Catalyst use); USES (Uses)
(isoprene-styrene rubber, block; synthesis of hydrogen peroxide from oxygen and hydrogen using catalyst)
- IT 7664-41-7, Ammonia, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(oxidation of; synthesis of hydrogen peroxide from oxygen and hydrogen using catalyst)
- IT 71-43-2, Benzene, uses 91-17-8, Decaline 91-20-3, Naphthalene, uses 91-20-3D, Naphthalene, alkyl derivs. 98-82-8, Cumene 100-41-4, Ethylbenzene, uses 108-87-2, Methylcyclohexane 108-88-3, Toluene, uses 110-54-3, n-Hexane, uses 110-82-7, Cyclohexane, uses

111-65-9, n-Octane, uses 124-18-5, n-Decane
142-82-5, n-Heptane, uses 1330-20-7, Xylene, uses 1634-04-4,
Methyl tert-butyl ether 1678-91-7, Ethylcyclohexane 27195-67-1,
Dimethylcyclohexane
RL: MOA (Modifier or additive use); NUU (Other use,
unclassified); USES (Uses)
(solvent; synthesis of hydrogen peroxide from oxygen and
hydrogen using catalyst)

IT 64-17-5, Ethanol, uses 67-56-1, Methanol, uses 75-65-0, tert. Butanol,
uses 7732-18-5, Water, uses
RL: NUU (Other use, unclassified); USES (Uses)
(solvent; synthesis of hydrogen peroxide from oxygen and hydrogen using
catalyst)

IT 9003-55-8
RL: CAT (Catalyst use); USES (Uses)
(styrene-butadiene rubber, synthesis of hydrogen peroxide from oxygen
and hydrogen using catalyst)

IT 7439-88-5, Iridium, uses 7440-05-3,
Palladium, uses 7440-06-4, Platinum, uses
7440-16-6, Rhodium, uses 7440-18-8,
Ruthenium, uses 7440-57-5, Gold, uses 9002-88-4, Polyethylene
9003-07-0, Polypropylene 9003-17-2, Polybutadiene 9003-53-6,
Polystyrene 9003-55-8, Butadiene-styrene copolymer 9010-79-1, Ethylene
propylene copolymer
RL: CAT (Catalyst use); USES (Uses)
(synthesis of hydrogen peroxide from oxygen and hydrogen using
catalyst)

IT 7722-84-1P, Hydrogen peroxide, preparation
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT
(Reactant or reagent)
(synthesis of hydrogen peroxide from oxygen and hydrogen using
catalyst)

IT 7440-37-1, Argon, uses 7440-59-7, Helium, uses 7727-37-9,
Nitrogen, uses
RL: MOA (Modifier or additive use); NUU (Other use,
unclassified); USES (Uses)
(synthesis of hydrogen peroxide from oxygen and hydrogen
using catalyst)

IT 1333-74-0, Hydrogen, reactions 7782-44-7, Oxygen, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(synthesis of hydrogen peroxide from oxygen and hydrogen using
catalyst)

IT 7440-44-0, Carbon, uses
RL: CAT (Catalyst use); USES (Uses)
(catalyst support; synthesis of hydrogen peroxide from oxygen
and hydrogen using catalyst)

RN 7440-44-0 HCAPLUS
CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

IT 7439-88-5, Iridium, uses 7440-05-3,
Palladium, uses 7440-06-4, Platinum, uses
7440-16-6, Rhodium, uses 7440-18-8,
Ruthenium, uses
RL: CAT (Catalyst use); USES (Uses)
(synthesis of hydrogen peroxide from oxygen and hydrogen using
catalyst)

RN 7439-88-5 HCAPLUS
CN Iridium (8CI, 9CI) (CA INDEX NAME)

Ir

RN 7440-05-3 HCAPLUS
CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-06-4 HCAPLUS
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-16-6 HCAPLUS
CN Rhodium (8CI, 9CI) (CA INDEX NAME)

Rh

RN 7440-18-8 HCAPLUS
CN Ruthenium (8CI, 9CI) (CA INDEX NAME)

Ru

L82 ANSWER 19 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2003:58293 HCAPLUS
DN 138:97278
ED Entered STN: 24 Jan 2003
TI Electrode compositions and configurations for electrochemical bioreactor systems
IN Zeikus, Joseph Gregory; Park, Doo Hyun
PA Michigan Biotechnology Institute, USA
SO PCT Int. Appl., 60 pp.
CODEN: PIXXD2
DT Patent
LA English
IC ICM C25B003-00
ICS C02F001-461; C12N009-02; C12Q001-32; G01N027-26; G01N033-53;
G01N033-543; H01M008-16
CC 72-2 (Electrochemistry)
Section cross-reference(s): 9, 16, 60, 67

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2003006713	A1	20030123	WO 2002-US17143	20020531
	W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR,			

LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH,
 PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ,
 UA, UG, US, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU,
 TJ, TM

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH,
 CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR,
 BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

CA 2448512	AA	20030123	CA 2002-2448512	20020531
US 2004241771	A1	20041202	US 2003-477273	20031112
PRAI US 2001-294943P	P	20010531		
US 2001-338245P	P	20011108		
US 2002-353037P	P	20020130		
WO 2002-US17143	W	20020531		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
WO 2003006713	ICM	C25B003-00
	ICS	C02F001-461; C12N009-02; C12Q001-32; G01N027-26; G01N033-53; G01N033-543; H01M008-16
WO 2003006713	ECLA	C02F001/46B; C12M001/40; C12P001/00; C12P007/46; C12Q001/00B4; C12Q001/02; C12Q001/26; H01M008/16
US 2004241771	NCL	435/007.320
	ECLA	C12P001/00; C12P007/46; C12Q001/00B4; C12Q001/02; C12Q001/26; H01M008/16

AB Electrodes compns. and configurations for electrochem. bioreactor systems that can use elec. energy as a source of reducing power in fermentation or enzymic reactions and that can use electron mediators and a biocatalyst, such as cells or enzymes, to produce electricity are disclosed. Example electrodes in the system may comprise: (1) neutral red covalently bound to graphite felt (Figure 1); (2) a carboxylated cellulose bound to the graphite felt, neutral red bound to the carboxylated cellulose, NAD⁺ bound to the graphite felt, and an oxidoreductase (e.g., fumarate reductase) bound to the graphite felt; or (3) a metal ion electron mediator bound to graphite. Various biocatalysts, such as an oxidoreductase, cells of *Actinobacillus succinogenes*, cells of *Escherichia coli*, and sewage sludge, are suitable for use in the electrochem. bioreactor system.

ST electrode compn configurations electrochem bioreactor enzymes

IT Electrodes

(compns. and configurations for electrochem. bioreactor systems)

IT Bioreactors

(electrochem.; electrode compns. and configurations for electrochem. bioreactor systems)

IT Enzymes, uses

RL: BCP (Biochemical process); CAT (Catalyst use); BIOL

(Biological study); PROC (Process); USES (Uses)

(electrode compns. and configurations for electrochem. bioreactor systems containing)

IT Fermentation

(electrode compns. and configurations for electrochem. bioreactor systems for)

IT Electricity

(electrode compns. and configurations for electrochem. bioreactor systems for prucing)

IT *Actinobacillus succinogenes*

Escherichia coli

Wastewater treatment sludge

(electrode compns. and configurations for electrochem. bioreactor systems, containing)

IT Cations

(electrode compns. and configurations for electrochem. bioreactor

systems, containing metal ion covalently bound to graphite felt)

IT 9004-34-6, Cellulose, uses
RL: NUU (Other use, unclassified); USES (Uses)
(carboxylated; electrode compns. and configurations for electrochem. bioreactor systems, containing carboxylated cellulose covalently bound to graphite felt)

IT 553-24-2, Neutral red
RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent); USES (Uses)
(electrode compns. and configurations for electrochem. bioreactor systems, containing)

IT 865-05-4 9055-15-6, Oxidoreductase 9076-99-7, Fumarate reductase
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(electrode compns. and configurations for electrochem. bioreactor systems, containing NAD covalently bound to graphite felt)

IT 7782-42-5, Graphite, uses
RL: DEV (Device component use); USES (Uses)
(electrode compns. and configurations for electrochem. bioreactor systems, containing neutral red covalently bound to graphite felt)

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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(2) Kim; US 5976719 A 1999 HCAPLUS
(3) Mellor; US 5403450 A 1995 HCAPLUS
(4) Zeikus; US 4352885 A 1982 HCAPLUS
(5) Zeikus; US 6270649 B1 2001 HCAPLUS

L82 ANSWER 20 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2003:922201 HCAPLUS

DN 140:29440

ED Entered STN: 26 Nov 2003

TI Study on oxygen electrode of PEMFC - effect of Ni and Co on properties of Pt/C electro-catalyst

AU Zhang, Xi-gui; Wang, Tao; Xia, Bao-jia; Qin, Pei; Xu, Nai-xin

CS Energy Dep., Shanghai Inst. Microsystem and Information Technol., Chinese Acad. Sci., Shanghai, 200050, Peop. Rep. China

SO Ranliao Huaxue Xuebao (2003), 31(5), 411-414

CODEN: RHXUD8; ISSN: 0253-2409

PB Kexue Chubanshe

DT Journal

LA Chinese

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 67

AB A new electrocatalyst for PEMFCs was developed by adding the catalytic promoters, Ni and Co using a liquid co-deposition method. Activity improvement of the electrocatalyst was confirmed by O electrode polarization measurements. When the amts. of Ni and Co were 0.8% and 1% (based on C), resp., the electro-catalyst performed better. SEM and TEM showed that the Pt/C electro-catalysts were in a highly dispersed state, due to the existence of Ni and Co. After a 96 h test, no obvious deactivation was observed

ST cobalt nickel platinum carbon cathode oxygen electrocatalyst fuel cell

IT Fuel cell cathodes
(catalytic; effect of Ni and Co on properties of Pt/C electro-catalysts in oxygen electrodes of fuel cells)

IT Catalysts
(electrocatalysts; effect of Ni and Co on properties of Pt/C

electro-catalysts in oxygen electrodes of fuel cells)
IT 7440-06-4, Platinum, uses
RL: CAT (Catalyst use); USES (Uses)
(effect of Ni and Co on properties of Pt
/C electro-catalysts in oxygen electrodes of fuel cells)
IT 7440-02-0, Nickel, uses 7440-48-4,
Cobalt, uses
RL: CAT (Catalyst use); MOA (Modifier or additive use)
; USES (Uses)
(effect of Ni and Co on properties of Pt
/C electro-catalysts in oxygen electrodes of fuel
cells)
IT 7440-44-0, Carbon, uses
RL: CAT (Catalyst use); USES (Uses)
(support; effect of Ni and Co on
properties of Pt/C electro-catalysts in oxygen electrodes of
fuel cells)
IT 7440-06-4, Platinum, uses
RL: CAT (Catalyst use); USES (Uses)
(effect of Ni and Co on properties of Pt
/C electro-catalysts in oxygen electrodes of fuel cells)
RN 7440-06-4 HCAPLUS
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt
IT 7440-02-0, Nickel, uses 7440-48-4,
Cobalt, uses
RL: CAT (Catalyst use); MOA (Modifier or additive use)
; USES (Uses)
(effect of Ni and Co on properties of Pt
/C electro-catalysts in oxygen electrodes of fuel
cells)
RN 7440-02-0 HCAPLUS
CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni
RN 7440-48-4 HCAPLUS
CN Cobalt (8CI, 9CI) (CA INDEX NAME)

Co
IT 7440-44-0, Carbon, uses
RL: CAT (Catalyst use); USES (Uses)
(support; effect of Ni and Co on
properties of Pt/C electro-catalysts in oxygen electrodes of
fuel cells)
RN 7440-44-0 HCAPLUS
CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

L82 ANSWER 21 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2003:691150 HCAPLUS
DN 140:323127
ED Entered STN: 04 Sep 2003
TI Catalytic air oxidation of toluene in supercritical CO2 using solid supported surfactants containing Co(II) species
AU Zhu, Jie; Robertson, Alan; Tsang, Shik Chi
CS Surface and Catalysis Research Centre, Department of Chemistry, The University of Reading, Whiteknights, Reading, RG6 6AD, UK
SO Catalysis in Application, [Papers presented at the International Symposium on Applied Catalysis], Glasgow, United Kingdom, July 16-18, 2003 (2003), 266-271. Editor(s): Jackson, S. David; Hargreaves, Justin S. J.; Lennon, David. Publisher: Royal Society of Chemistry, Cambridge, UK. CODEN: 69ELBN; ISBN: 0-85404-608-9
DT Conference
LA English
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes) Section cross-reference(s): 25, 67
AB Solid catalysts containing Co(II) species for air oxidation of toluene in supercrit. carbon dioxide (scCO2) were prepared and evaluated. The preparation of the catalyst involves covalent bonding of hexadecafluorosebacic acid surfactant mols. and aminopropyltriethoxysilane surface groups on ultra-high-pore-volume silica support, followed by reaction with Co(OAc)2. The supported cobalt catalyst was tested in the air oxidation of toluene in the presence of NaBr and water in scCO2. High conversion (98.6%) and selectivity (98.9% to benzoic acid) was achieved with an estimated average turnover frequency of $1.5 \times 10^{-3} \text{ s}^{-1}$ over the silica catalyst containing the Co/NaBr species. The good interface between Co species and the substrate and the ease of reversibility of the Co(II)/Co(III) species enhanced the efficiency of the catalysts.
ST toluene air oxidn supercrit carbon dioxide cobalt catalyst support; surfactant anchoring silica support cobalt catalyst oxidn
IT Supercritical fluids (CO2 solvent; silica-anchored hexadecafluorosebacic acid/Co catalyst activity and selectivity in air oxidation of toluene in supercrit. CO2)
IT Oxidation catalysts (air oxidation; silica-anchored hexadecafluorosebacic acid/Co catalyst activity and selectivity in air oxidation of toluene in supercrit. CO2)
IT Surfactants (silica-anchored hexadecafluorosebacic acid/Co catalyst activity and selectivity in air oxidation of toluene in supercrit. CO2)
IT Catalyst supports (silica-silane anchored surfactants; silica-anchored hexadecafluorosebacic acid/Co catalyst activity and selectivity in air oxidation of toluene in supercrit. CO2)
IT 307-78-8, Perfluorosebacic acid 919-30-2, Aminopropyltriethoxysilane RL: CAT (Catalyst use); CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses) (anchoring mol., support; silica-anchored hexadecafluorosebacic acid/Co catalyst activity and selectivity in air oxidation of toluene in supercrit. CO2)
IT 7647-15-6, Sodium bromide (NaBr), uses RL: CAT (Catalyst use); USES (Uses) (catalyst promoter; silica-anchored hexadecafluorosebacic acid/Co catalyst activity and selectivity in air oxidation of toluene in supercrit. CO2)
IT 7440-48-4, Cobalt, uses RL: CAT (Catalyst use); USES (Uses)

(redox couple, oxidation catalyst; silica-anchored hexadecafluorosebacic acid/Co catalyst activity and selectivity in air oxidation of toluene in supercrit. CO2)

IT 65-85-0P, Benzoic acid, preparation

RL: IMF (Industrial manufacture); PREP (Preparation)

(silica-anchored hexadecafluorosebacic acid/Co catalyst activity and selectivity in air oxidation of toluene in supercrit. CO2)

IT 71-48-7, Cobalt diacetate 108-88-3, Toluene, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(silica-anchored hexadecafluorosebacic acid/Co catalyst activity and selectivity in air oxidation of toluene in supercrit. CO2)

IT 124-38-9, Carbon dioxide, uses

RL: NUU (Other use, unclassified); USES (Uses)

(supercrit., solvent; silica-anchored hexadecafluorosebacic acid/Co catalyst activity and selectivity in air oxidation of toluene in supercrit. CO2)

IT 7631-86-9, Silica, processes

RL: CAT (Catalyst use); CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)

(ultra-high-pore-volume, support; silica-anchored hexadecafluorosebacic acid/Co catalyst activity and selectivity in air oxidation of toluene in supercrit. CO2)

RE.CNT 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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IT 7440-48-4, Cobalt, uses

RL: CAT (Catalyst use); USES (Uses)

(redox couple, oxidation catalyst; silica-anchored hexadecafluorosebacic acid/Co catalyst activity and selectivity in air oxidation of toluene in supercrit. CO2)

RN 7440-48-4 HCAPLUS

CN Cobalt (8CI, 9CI) (CA INDEX NAME)

Co

L82 ANSWER 22 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2003:171287 HCAPLUS

DN 139:58383

ED Entered STN: 07 Mar 2003

TI Size and Support Effects for CO Adsorption on Gold Model Catalysts

AU Shaikhutdinov, Sh. K.; Meyer, R.; Naschitzki, M.; Baeumer, M.; Freund, H.-J.

CS Department of Chemical Physics, Fritz-Haber-Institut der
Max-Planck-Gesellschaft, Berlin, 14195, Germany

SO Catalysis Letters (2003), 86(4), 211-219
CODEN: CALBER; ISSN: 1011-372X

PB Kluwer Academic/Plenum Publishers

DT Journal

LA English

CC 66-3 (Surface Chemistry and Colloids)
Section cross-reference(s): 67

AB CO adsorption on gold particles deposited on well-ordered alumina and iron
oxide films was studied with temperature-programmed desorption. Scanning
tunneling microscopy was used to provide correlative structural
characterization. The results show that the adsorption of CO on gold
exhibits a size effect in that small particles adsorb CO more strongly.
For a given particle size (.apprx.3 nm), CO desorption temperature (at
.apprx.170 K) is essentially independent of the supports studied.
Therefore, support effects seen in CO oxidation on real catalytic systems
must arise from the interaction of oxygen rather than CO with these
catalysts.

ST gold catalyst nanoparticle size carbon monoxide
adsorption support

IT Annealing
Sintering
(effect on size and support effects for CO adsorption on gold model
catalysts)

IT Adsorption
Nanoparticles
Oxidation catalysts
Particle size
(size and support effects for CO adsorption on gold model
catalysts)

IT Desorption
(thermal; size and support effects for CO adsorption on gold model
catalysts)

IT 7782-44-7, Oxygen, processes
RL: CPS (Chemical process); MOA (Modifier or additive use); PEP
(Physical, engineering or chemical process); PROC (Process); USES (Uses)
(effect on size and support effects for CO adsorption on gold model
catalysts)

IT 7440-57-5, Gold, processes
RL: CAT (Catalyst use); CPS (Chemical process); PEP (Physical,
engineering or chemical process); PROC (Process); USES (Uses)
(size and support effects for CO adsorption on gold model
catalysts)

IT 630-08-0, Carbon monoxide, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical
process); PROC (Process)
(size and support effects for CO adsorption on gold model
catalysts)

IT 1317-61-9, Iron oxide Fe₃O₄, processes 1344-28-1, Alumina,
processes 1345-25-1, Iron oxide FeO, processes
RL: CAT (Catalyst use); CPS (Chemical process); PEP (Physical,
engineering or chemical process); PROC (Process); USES (Uses)
(support; size and support effects for CO adsorption on gold
model catalysts)

RE.CNT 40 THERE ARE 40 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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L82 ANSWER 23 OF 62 COMPENDEX COPYRIGHT 2005 EEI on STN

AN 2002(37):2931 COMPENDEX

TI **Oxygen electroreduction on carbon-supported platinum catalysts.** Particle-size effect on the tolerance to methanol competition.

AU Gloaguen, Frederic (UMR 6503 CNRS Equipe Electrocatalyse Universite de Poitiers, 86000 Poitiers, France); Maillard, F.; Martin, M.; Leger, J.-M.

SO Electrochimica Acta v 47 n 21 Aug 15 2002 2002.p 3431-3440
CODEN: ELCAAV ISSN: 0013-4686

PY 2002

DT Journal

TC Theoretical; Experimental

LA English

AB The kinetics of oxygen reduction in methanol-containing acid electrolyte was investigated at platinum-based electrodes using the porous rotating disk electrodes (RDE) technique. Utilization of commercial-grade (E-TEK) carbon-supported Pt particles with narrow size distribution provided evidences for a particle size effect on the tolerance of oxygen reduction electrocatalysts to methanol competition. In methanol-containing perchloric acid electrolyte, the mass activity (MA, A g⁻¹ Pt) for oxygen reduction increases continuously with a decrease in particle size from d = 4.6 to 2.3 nm,

whereas in methanol-free electrolyte MA is roughly independent of the size, when $d < 3.5$ nm. Effects of addition of a second metal to Pt were also investigated. Based on particle size considerations Pt:Cr-C appears to be a more active catalyst than Pt-C for oxygen reduction in methanol-containing electrolyte. \$CPY 2002 Elsevier Science Ltd. All rights reserved. 44 Refs.

CC 533.1 Ore Treatment; 802.2 Chemical Reactions; 547.1 Precious Metals; 803 Chemical Agents; 804 Chemical Products Generally; 804.1 Organic Components

CT *Electrolytic reduction; Oxygen; Carbon; Methanol; Particle size analysis; Electrolytes; Electrochemical electrodes; Platinum; Catalysts

ST Oxygen electroreduction; Rotating disk electrodes (RDE)

ET Pt; C*Cr*Pt; C sy 3; sy 3; Cr sy 3; Pt sy 3; Cr doping; doped materials; Pt:Cr-C; C*Pt; Pt-C

L82 ANSWER 24 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2002:884480 HCAPLUS

DN 138:190438

ED Entered STN: 22 Nov 2002

TI Porous nanocomposites of zirconium dioxide and silicate

AU Zhu, H. Y.; Hao, Z. P.; Barry, J. C.

CS Department of Chemical Engineering, The University of Queensland, St. Lucia, 4072, Australia

SO Chemical Communications (Cambridge, United Kingdom) (2002), (23), 2858-2859

CODEN: CHCOFS; ISSN: 1359-7345

PB Royal Society of Chemistry

DT Journal

LA English

CC 51-12 (Fossil Fuels, Derivatives, and Related Products)

Section cross-reference(s): 67

AB Highly porous nanocomposites of zirconium dioxide and silicate are synthesized in an aqueous system from an inorg. salt of zirconium; the nanocomposites, with tailorable pore structures, exhibit superior performance as catalyst supports.

ST porous nanocomposite zirconium dioxide laponite silicate composite catalyst support; mesoporous nanocomposite nickel layered zirconium dioxide alumina combustion catalyst.

IT Polyoxyalkylenes, uses

RL: MOA (Modifier or additive use); USES (Uses)

(C12-C14-monoethers; d.p. 5,7,9,12,30; mesoporous nanocomposites of zirconium dioxide and silicate compared with alumina as support for nickel catalyzed methane combustion)

IT Catalyst supports

Combustion

Nanocomposites

Porosity

(mesoporous nanocomposites of zirconium dioxide and silicate compared with alumina as support for nickel catalyzed methane combustion)

IT Porous materials

(mesoporous; mesoporous nanocomposites of zirconium dioxide and silicate compared with alumina as support for nickel catalyzed methane combustion)

IT Clays, uses

RL: CAT (Catalyst use); USES (Uses)

(smectitic, layered; mesoporous nanocomposites of zirconium dioxide and silicate compared with alumina as support for nickel catalyzed methane combustion)

IT 1306-38-3, Cerium dioxide (CeO₂), uses

- RL: CAT (Catalyst use); USES (Uses)
(added to ZrO₂-laponite composite; mesoporous nanocomposites of zirconium dioxide and silicate compared with alumina as support for nickel catalyzed methane combustion)
- IT 7440-02-0, Nickel, uses
RL: CAT (Catalyst use); USES (Uses)
(added to alumina support and ZrO₂-laponite composite support; mesoporous nanocomposites of zirconium dioxide and silicate compared with alumina as support for nickel catalyzed methane combustion)
- IT 25322-68-3D, Polyethylene oxide, C12-C14-monoethers
RL: MOA (Modifier or additive use); USES (Uses)
(d.p. 5,7,9,12,30; mesoporous nanocomposites of zirconium dioxide and silicate compared with alumina as support for nickel catalyzed methane combustion)
- IT 1344-28-1, Alumina, uses
RL: CAT (Catalyst use); USES (Uses)
(in ZrO₂-laponite composite and sole support for nickel; mesoporous nanocomposites of zirconium dioxide and silicate compared with alumina as support for nickel catalyzed methane combustion)
- IT 1309-48-4, Magnesium oxide (MgO), uses 7631-86-9, Silica, uses
RL: CAT (Catalyst use); USES (Uses)
(in ZrO₂-laponite composite; mesoporous nanocomposites of zirconium dioxide and silicate compared with alumina as support for nickel catalyzed methane combustion)
- IT 1313-59-3, Sodium oxide (Na₂O), uses
RL: CAT (Catalyst use); USES (Uses)
(in laponite; mesoporous nanocomposites of zirconium dioxide and silicate compared with alumina as support for nickel catalyzed methane combustion)
- IT 53320-86-8, Laponite
RL: CAT (Catalyst use); USES (Uses)
(mesoporous nanocomposites of zirconium dioxide and silicate compared with alumina as support for nickel catalyzed methane combustion)
- IT 1314-23-4P, Zirconium dioxide, uses
RL: CAT (Catalyst use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(mesoporous nanocomposites of zirconium dioxide and silicate compared with alumina as support for nickel catalyzed methane combustion)
- IT 74-82-8, Methane, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(mesoporous nanocomposites of zirconium dioxide and silicate compared with alumina as support for nickel catalyzed methane combustion)
- IT 7699-43-6
RL: RCT (Reactant); RACT (Reactant or reagent)
(precursor; mesoporous nanocomposites of zirconium dioxide and silicate compared with alumina as support for nickel catalyzed methane combustion)

RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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IT 7440-02-0, Nickel, uses

RL: CAT (Catalyst use); USES (Uses)

(added to alumina support and ZrO2-laponite composite support
; mesoporous nanocomposites of zirconium dioxide and silicate
compared with alumina as support for nickel catalyzed methane
combustion)

RN 7440-02-0 HCAPLUS

CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

L82 ANSWER 25 OF 62 JICST-EPlus COPYRIGHT 2005 JST on STN

AN 1020420636 JICST-EPlus

TI Performance of PEMFC catalyst layer employing conventional activated
carbon supporting Pt for cathodic
oxygen reduction.

AU MARUYAMA JUN; ABE IKUO

CS Osaka Munic. Tech. Res. Inst.

SO Nippon Kagakkai Koen Yokoshu, (2002) vol. 81st, no. 1, pp. 475. Journal
Code: S0493A (Fig. 1)

ISSN: 0285-7626

CY Japan

DT Conference; Short Communication

LA Japanese

STA New

AB Improving PEMFC performance requires active electrode catalyst
for cathodic oxygen reduction. In the present study, a catalyst
powder based on activated carbon conventionally used in various processes
such as decolorization, on which highly dispersed Pt was
supported (Pt/AC), was used for the electrode catalyst instead of
the familiar electrocatalyst; Pt supported on
carbon black (Pt/C). Oxygen reduction current was
measured by using the RDE method after the electrocatalyst was fixed on
the RDE as a catalyst layer. The current was extremely higher at the
Pt/AC layer than that at the Pt/C layer at the
high-potential region, although lower at the low-potential region. (author
abst.)

CC CB07050F (544.653)

CT oxygen electrode; electrolytic current; electrode catalyst; catalytic
reduction; activated carbon; platinum catalyst; supported
catalyst; oxidation-reduction reaction; rotating electrode; catalytic
activity; specific surface area; charge transfer reaction; rate-limiting;
electrochemical behavior; fuel cell; solid polyelectrolyte
BT electrode; electric current; catalyst; reduction (reaction); chemical
reaction; catalytic reaction; carbon material; inorganic material;
material; transition metal catalyst; metal catalyst; oxidation; activity;
property; surface area; area; geometric quantity; ratio; velocity;
behavior; chemical cell; battery; polyelectrolyte; functional polymer;
macromolecule; electrolyte; matter; solid electrolyte

L82 ANSWER 26 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2003:7043 HCAPLUS

DN 139:8394

ED Entered STN: 06 Jan 2003

- TI Strategies for the heterogenization of rhodium complexes on activated carbon
- AU Diaz-Aunon, J. A.; Roman-Martinez, M. C.; Salinas-Martinez de Lecea, C.; Alper, H.
- CS Departamento de Quimica Inorganica, Facultad de Ciencias, Universidad de Alicante, Alicante, 03080, Spain
- SO Studies in Surface Science and Catalysis (2002), 143 (Scientific Bases for the Preparation of Heterogeneous Catalysts), 295-304
CODEN: SSCTDM; ISSN: 0167-2991
- PB Elsevier Science B.V.
- DT Journal
- LA English
- CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
Section cross-reference(s): 67, 78
- OS CASREACT 139:8394
- AB Heterogenized rhodium complexes were prepared and evaluated as hydroformylation catalysts. The $[\text{Rh}(\mu\text{-Cl})(\text{C}_8\text{H}_{12})]_2$ complex ($\text{Rh}(\text{COD})$) was used as catalyst and precursor. The preparation strategies include ion exchange of $\text{Rh}(\text{COD})$ on oxidized and chlorinated activated carbon supports; addition of diphosphine ligands to supported $\text{Rh}(\text{COD})$ to increase stability; functionalization of the support to allow covalent bonds with phosphine ligands; and preparation of $\text{Rh}(\text{HONP})$. ($\text{HONP} = \text{HO}(\text{CH}_2)_3\text{N}(\text{CH}_2\text{P}(\text{C}_6\text{H}_5)_2)_2$) complex prior to anchoring on support. The ion exchange product had low stability and only in the first run showed catalytic activity similar to that of homogeneous $\text{Rh}(\text{COD})$ catalyst. When diphosphine ligands were added, the catalysts were even less stable and less active. The functionalization of the support to bind the diphosphine ligands produced highly active catalysts, stable for four consecutive catalytic runs. Best results were obtained with $\text{Rh}(\text{HONP})$ prepared prior to the heterogenization step (ligand-support anchoring) in hydroformylation of 1-octene to 1-nonanal with 2-octene as byproduct.
- ST rhodium cyclooctadiene ion exchange activated carbon support catalyst activity; phosphine ligand rhodium cyclooctadiene hydroformylation catalyst stability; hydroxydiphosphine rhodium complex prepn activity stability hydroformylation octene
- IT Catalyst supports
(activated carbons; strategies for preparation of heterogeneous rhodium complex/activated carbon catalysts and activity and stability in hydroformylation of 1-octene)
- IT Hydroformylation catalysts
Ion exchange
(strategies for preparation of heterogeneous rhodium complex/activated carbon catalysts and activity and stability in hydroformylation of 1-octene)
- IT 7440-44-0D, Activated carbon, oxidized and chlorinated
RL: CAT (Catalyst use); USES (Uses)
(activated, hydroformylation catalyst support; strategies for preparation of heterogeneous rhodium complex/activated carbon catalysts and activity and stability in hydroformylation of 1-octene)
- IT 7440-44-0, Activated carbon, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(activated, precursor, ROX 0.8 and Norit GF 45; strategies for preparation of heterogeneous rhodium complex/activated carbon catalysts and activity and stability in hydroformylation of 1-octene)
- IT 535926-12-6P
RL: CAT (Catalyst use); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)
(catalyst ligand and precursor; strategies for preparation of heterogeneous rhodium complex/activated carbon catalysts and activity and stability in hydroformylation of 1-octene)

- IT 12092-47-6
RL: CAT (Catalyst use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(hydroformylation catalyst and precursor; strategies for preparation of heterogeneous rhodium complex/activated carbon catalysts and activity and stability in hydroformylation of 1-octene)
- IT 535926-13-7P
RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(hydroformylation catalyst; strategies for preparation of heterogeneous rhodium complex/activated carbon catalysts and activity and stability in hydroformylation of 1-octene)
- IT 111-67-1P, 2-Octene
RL: BYP (Byproduct); PREP (Preparation)
(strategies for preparation of heterogeneous rhodium complex/activated carbon catalysts and activity and stability in hydroformylation of 1-octene)
- IT 70196-23-5P
RL: CAT (Catalyst use); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(strategies for preparation of heterogeneous rhodium complex/activated carbon catalysts and activity and stability in hydroformylation of 1-octene)
- IT 124-19-6P, Nonanal
RL: IMF (Industrial manufacture); PREP (Preparation)
(strategies for preparation of heterogeneous rhodium complex/activated carbon catalysts and activity and stability in hydroformylation of 1-octene)
- IT 111-66-0, 1-Octene 156-87-6, 3-Aminopropanol 630-08-0, Carbon monoxide, reactions 829-85-6, Diphenylphosphine 1333-74-0, Hydrogen, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(strategies for preparation of heterogeneous rhodium complex/activated carbon catalysts and activity and stability in hydroformylation of 1-octene)

RE.CNT 25 THERE ARE 25 CITED REFERENCES AVAILABLE FOR THIS RECORD

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- L82 ANSWER 27 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2002:354808 HCAPLUS
DN 137:129005
ED Entered STN: 13 May 2002
TI Effect of support on catalytic property of Fe catalyst for sulfur dioxide reduction to elemental sulfur by carbon monoxide
AU Hu, Da-wei; Qin, Yong-ning; Ma, Zhi; Han, Sen
CS School of Chemical Engineering, Tianjin University, Tianjin, 300072; Peop. Rep. China
SO Ranliao Huaxue Xuebao (2002), 30(2), 156-161
CODEN: RHXUD8; ISSN: 0253-2409
PB Kexue Chubanshe
DT Journal
LA Chinese
CC 59-4 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 67
AB The reduction of sulfur dioxide by carbon monoxide over the iron oxide supported by several types of supports (MgO, α -Al₂O₃, γ -Al₂O₃, Ce- γ -Al₂O₃) was studied. The results demonstrated that the SO₂ conversion efficiency and the sulfur selectivity exhibit the following order: Ce- γ -Al₂O₃ > γ -Al₂O₃ > α -Al₂O₃ > MgO. The results of BET showed that the surface area plays an important role in catalyst activity. XRD result revealed that the transformation of Fe₂O₃ to the FeS₂ during the reaction; it could be concluded that FeS₂ was catalytically active. The results of TPR and TG indicated that the sulfidation of catalyst is closely related to the surface reaction behavior of catalyst. It was found that Ce-modified γ -Al₂O₃ can improve the formation of FeS₂ and offer the oxygen vacancy in reaction. The redox mechanism was confirmed to be the simultaneous contribution from both COS intermediate mechanism and oxygen vacancy mechanism.
ST catalyst support alumina iron sulfur dioxide redn carbon monoxide; flue gas desulfurization support alumina catalyst; iron
IT Catalyst supports
Flue gas desulfurization
(effect of support on catalytic property of Fe catalyst for sulfur dioxide reduction to elemental sulfur by carbon monoxide)
IT 7440-45-1, Cerium, uses
RL: CAT (Catalyst use); MOA (Modifier or additive use)
; USES (Uses)
(-modified γ -Al₂O₃; effect of support on catalytic property of Fe catalyst for sulfur dioxide reduction to elemental sulfur by carbon monoxide)
IT 1309-37-1, Iron oxide, uses
RL: CAT (Catalyst use); USES (Uses)
(effect of support on catalytic property of Fe catalyst for sulfur dioxide reduction to elemental sulfur by carbon monoxide)
IT 12068-85-8, Iron sulfide fes2
RL: CAT (Catalyst use); FMU (Formation, unclassified); FORM (Formation, nonpreparative); USES (Uses)
(effect of support on catalytic property of Fe catalyst for sulfur dioxide reduction to elemental sulfur by carbon monoxide)
IT 7704-34-9, Sulfur, formation (nonpreparative)
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(effect of support on catalytic property of Fe catalyst for sulfur dioxide reduction to elemental sulfur by carbon monoxide)
IT 630-08-0, Carbon monoxide, reactions

- RL: RCT (Reactant); RACT (Reactant or reagent)
(effect of support on catalytic property of Fe catalyst for sulfur dioxide reduction to elemental sulfur by carbon monoxide)
- IT 7446-09-5, Sulfur dioxide, reactions
RL: RCT (Reactant); REM (Removal or disposal); PROC (Process); RACT (Reactant or reagent)
(effect of support on catalytic property of Fe catalyst for sulfur dioxide reduction to elemental sulfur by carbon monoxide)
- IT 1309-48-4, Magnesium oxide (MgO), uses
RL: CAT (Catalyst use); USES (Uses)
(support; effect of support on catalytic property of Fe catalyst for sulfur dioxide reduction to elemental sulfur by carbon monoxide)
- IT 1344-28-1, Aluminum oxide, uses
RL: CAT (Catalyst use); USES (Uses)
(α - and γ -, support; effect of support on catalytic property of Fe catalyst for sulfur dioxide reduction to elemental sulfur by carbon monoxide)
- L82 ANSWER 28 OF 62 COMPENDEX COPYRIGHT 2005 EEI on STN
AN 2002(50):4156 COMPENDEX
TI EXAFS, XPS and electrochemical studies on oxygen reduction catalysts obtained by heat treatment of iron phenanthroline complexes supported on high surface area carbon black.
AU Bron, M. (Department Solar Energetics Hahn-Meitner-Institut Berlin, D-14109 Berlin, Germany); Radnik, J.; Fieber-Erdmann, M.; Bogdanoff, P.; Fiechter, S.
SO Journal of Electroanalytical Chemistry v 535 n 1-2 Nov 1 2002 2002.p 113-119
CODEN: JECHES ISSN: 0022-0728
PY 2002
DT Journal
TC Theoretical
LA English
AB Oxygen reduction catalysts have been prepared on the basis of heat-treated, carbon supported iron phenanthroline complexes. The activity of the catalyst towards oxygen reduction depends on the surface area of the carbon used in the synthesis. It is higher than the activity of other alternative oxygen reduction catalysts based on ruthenium. Related to the amount of metal, the activity is comparable to that of the state-of-the-art oxygen reduction catalyst, platinum supported onto carbon. EXAFS measurements indicate that the structure of the active centre of the catalyst consists of an iron ion, which is coordinated to four nitrogen atoms. No crystalline particles can be found in the catalyst using TEM. \$CPY 2002 Elsevier Science B.V. All rights reserved. 42 Refs.
CC 803 Chemical Agents; 804 Chemical Products Generally; 802.2 Chemical Reactions; 537.1 Heat Treatment Processes; 545.1 Iron; 801 Chemistry
CT *Catalysts; Heat treatment; Iron; Complexation; Carbon black; Synthesis (chemical); X ray photoelectron spectroscopy; Oxygen; Reduction
ST Oxygen reduction catalysts
- L82 ANSWER 29 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2002:861102 HCAPLUS
DN 138:141131
ED Entered STN: 13 Nov 2002
TI Mechanical and chemical breaking of multiwalled carbon nanotubes

- AU Niesz, Krisztian; Siska, Andrea; Vesselenyi, Istvan; Hernadi, Klara; Mehn, Dora; Galbacs, Gabor; Konya, Zoltan; Kiricsi, Imre
- CS Laboratoire de R.M.N., Facultes Universitaires Notre-Dame de la Paix, Namur, B-5000, Belg.
- SO Catalysis Today (2002), 76(1), 3-10
CODEN: CATTEA; ISSN: 0920-5861
- PB Elsevier Science B.V.
- DT Journal
- LA English
- CC 57-8 (Ceramics)
Section cross-reference(s): 49, 67
- AB Catalytically prepared multiwall carbon nanotubes (MWNTs) were cut and functionalized by mech. and/or chemical methods. Products were characterized by TEM, IR spectroscopy and BET method. It can be concluded that phys. and chemical breaking procedures compliment each other very well. With certain MWNT samples containing surface oxides preliminary investigations were done for testing them as catalyst support.
- ST carbon nanotube cutting functionalizing mech chem method
- IT Dehydrogenation catalysts
(carbon nanotube-platinum; mech. and chemical methods of breaking and functionalizing of multiwalled carbon nanotubes for use as catalyst support)
- IT Catalyst supports
(carbon nanotube; mech. and chemical methods of breaking and functionalizing of multiwalled carbon nanotubes for use as catalyst support)
- IT Nanotubes
(carbon; mech. and chemical methods of breaking and functionalizing of multiwalled carbon nanotubes for use as catalyst support)
- IT Pore size distribution
(mech. and chemical methods of breaking and functionalizing of multiwalled carbon nanotubes for use as catalyst support)
- IT Cutting
(mech. and chemical; mech. and chemical methods of breaking and functionalizing of multiwalled carbon nanotubes for use as catalyst support)
- IT Ball milling
(mech. cutting; mech. and chemical methods of breaking and functionalizing of multiwalled carbon nanotubes for use as catalyst support)
- IT 7440-06-4P, Platinum, preparation
RL: CAT (Catalyst use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(catalyst; mech. and chemical methods of breaking and functionalizing of multiwalled carbon nanotubes for use as catalyst support)
- IT 7664-93-9, Sulfuric acid, uses 7697-37-2, Nitric acid, uses
RL: NUU (Other use, unclassified); USES (Uses)
(chemical cutting agent; mech. and chemical methods of breaking and functionalizing of multiwalled carbon nanotubes for use as catalyst support)
- IT 107-15-3, Ethylene diamine, uses 108-24-7D, Acetylacetate, Et ester
7719-09-7, Sulfur oxychloride SOCl2 7722-64-7, Potassium permanganate
RL: MOA (Modifier or additive use); USES (Uses)
(functionalizing agent; mech. and chemical methods of breaking and functionalizing of multiwalled carbon nanotubes for use as catalyst support)
- IT 7440-44-0, Carbon, processes

RL: CAT (Catalyst use); CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)
(nanotubes; mech. and chemical methods of breaking and functionalizing of multiwalled carbon nanotubes for use as catalyst support)

IT 10025-99-7

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(platinum source; mech. and chemical methods of breaking and functionalizing of multiwalled carbon nanotubes for use as catalyst support)

RE.CNT 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS RECORD
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IT 7440-06-4P, Platinum, preparation

RL: CAT (Catalyst use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(catalyst; mech. and chemical methods of breaking and functionalizing of multiwalled carbon nanotubes for use as catalyst support)

RN 7440-06-4 HCAPLUS

CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

L82 ANSWER 30 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2001:179604 HCAPLUS

DN 134:228910

ED Entered STN: 15 Mar 2001

TI Alkanol resistant catalyst material for the electrochemical, selective oxygen reduction and a procedure for its production and its applications

IN Bogdanoff, Peter; Fiechter, Sebastian; Tributsch, Helmut; Bron, Michael; Dorbandt, Iris; Hilgendorff, Marcus; Schulenburg, Hendrik

PA Hahn-Meitner-Institut Berlin GmbH, Germany

SO Ger. Offen., 16 pp.
 CODEN: GWXXBX
 DT Patent
 LA German
 IC ICM B01J031-16
 ICS G01N027-30; H01M004-92
 CC 72-2 (Electrochemistry)
 Section cross-reference(s): 67
 FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI DE 10035841	A1	20010315	DE 2000-10035841	20000714
PRAI DE 1999-19936895	A1	19990729		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
DE 10035841	ICM	B01J031-16
	ICS	G01N027-30; H01M004-92
DE 10035841	ECLA	B01J031/16; B01J035/00C; H01M004/90

AB A development of not-toxic catalyst materials for oxygen electrochem. reduction based on ruthenium compds. with chalcogenide with comparably good characteristics, and addnl. decreasing pollution is described. The catalyst material according to an invention has a two-phase structure of nanoparticles, consisting of a crystalline core of a transition metal element and an amorphous, catalytically reactive cladding layer of corresponding, functional complexes. The invention is aimed at chalcogen-free catalyst material, whereby however the chalcogen introduction is possible by a subsequent treatment and catalytic activity was improved. Manufacturing processes involve purely aqueous solvents or direct separation or adsorption processes. The catalyst material according to invention with its high quality is environmentally more friendly and can be used in fuel cells and the O sensor technol.

ST alkanol resistant catalyst electrochem selective oxygen redn; ruthenium selenium chalcogen electroredn catalyst electrocatalyst

IT Reduction, electrochemical
 (alkanol resistant catalyst material for electrochem., selective oxygen based on ruthenium complexes and treated with selenium)

IT Fuel cells
 (alkanol resistant catalyst material for electrochem., selective oxygen based on ruthenium complexes and treated with selenium and their applications)

IT Reduction catalysts
 (electrochem.; alkanol resistant catalyst material for electrochem., selective oxygen based on ruthenium complexes and treated with selenium)

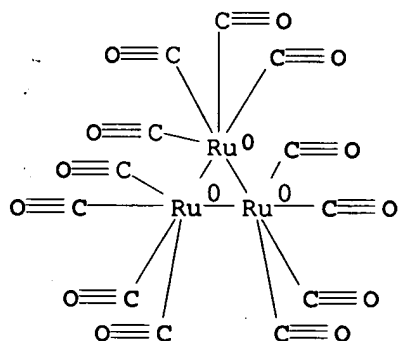
IT Sensors
 (electrochem.; alkanol resistant catalyst material for electrochem., selective oxygen based on ruthenium complexes and treated with selenium and their applications)

IT Group VIA elements
 RL: CAT (Catalyst use); USES (Uses)
 (ruthenium complexes; alkanol resistant catalyst material for electrochem., selective oxygen based on ruthenium complexes and treated with selenium and their applications)

IT Carbon black, uses
 RL: CAT (Catalyst use); USES (Uses)
 (support; alkanol resistant catalyst material for electrochem., selective oxygen based on ruthenium complexes and treated with selenium)

IT 7440-02-0, Nickel, uses 7440-18-8D, Ruthenium, chalcogen containing complex,

- uses 7704-34-9D, Sulfur, ruthenium complex containing, uses 7782-49-2D, Selenium, ruthenium complex containing, uses 13494-80-9D, Tellurium, ruthenium complex containing, uses
 RL: CAT (Catalyst use); USES (Uses)
 (alkanol resistant catalyst material for electrochem., selective oxygen based on ruthenium complexes and treated with selenium)
- IT 7782-49-2, Selenium, uses 10049-08-8, Ruthenium trichloride 14284-93-6, Ruthenium acetylacetonate 15243-33-1 153728-82-6, Ruthenium oxalate
 RL: CAT (Catalyst use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
 (alkanol resistant catalyst material for electrochem., selective oxygen based on ruthenium complexes and treated with selenium)
- IT 7782-44-7, Oxygen, processes
 RL: PEP (Physical, engineering or chemical process); PROC (Process)
 (alkanol resistant catalyst material for electrochem., selective oxygen based on ruthenium complexes and treated with selenium)
- IT 4221-96-9, Trioctylammonium bromide 16940-66-2, Sodium tetrahydroborate 16949-15-8, Lithium borohydride
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (alkanol resistant catalyst material for electrochem., selective oxygen based on ruthenium complexes and treated with selenium)
- IT 111-84-2, Nonane 629-59-4, Tetradecane
 RL: NUU (Other use, unclassified); USES (Uses)
 (solvent in production; alkanol resistant catalyst material for electrochem., selective oxygen based on ruthenium complexes and treated with selenium)
- IT 15243-33-1
 RL: CAT (Catalyst use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
 (alkanol resistant catalyst material for electrochem., selective oxygen based on ruthenium complexes and treated with selenium)
- RN 15243-33-1 HCAPLUS
 CN Ruthenium, dodecacarbonyltri-, triangulo (9CI) (CA INDEX NAME)



L82 ANSWER 31 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 2002:691594 HCAPLUS
 DN 137:203007
 ED Entered STN: 13 Sep 2002
 TI Oxidation of solid materials in absence of molecular oxygen
 IN Piccoli, Valerio; Rossini, Stefano; Sanfilippo, Domenico; Paggini, Alberto
 PA Snamprogetti S.p.A., Italy
 SO Ital. Appl., 17 pp.
 CODEN: ITXXCZ

DT Patent
 LA Italian
 IC ICM C07C
 CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
 Section cross-reference(s): 49, 67

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	IT 2000MI0550	A1	20010917	IT 2000-MI550	20000317
	IT 1318398	B1	20030825		
PRAI	IT 2000-MI550		20000317		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
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IT 2000MI0550	ICM	C07C
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AB A procedure is disclosed for oxidation of solids (e.g., molybdates and/or vanadates) in absence of mol. O₂. The process involves (1) oxidation of the molybdates and/or vanadates by extraction of O₂ from from an O carrier (e.g., CO₂, NO_x, SO_x, H₂O) at 250-600° and optionally (2) oxidation of a suitable reduced substrate (e.g., H₂, CO, C₁-30 hydrocarbons) by depleting O₂ from the oxidized solids with a simultaneous conversion of the latter to their reduced state. The process is suitable for (1) oxidative dehydrogenation for olefin manufacture, (2) selective partial oxidation for production of oxidized compds., (3) total oxidation for generation of elec. energy by combustion, and (4) manufacture of H₂ and CO_x. The oxidative dehydrogenation for olefin manufacture is carried out at a CO₂/alkane ratio of (0.1-0.5):1, 300-550°, ≤10 atm, and space velocity of (200-1,000)/h. The oxidation of hydrocarbons for manufacture of H₂ and CO_x is carried out at a H₂O/alkane ratio of (0.1-4):1, 400-600°, ≤5 atm, and a space velocity of (100-500)/h.

ST oxidn mol oxygen absence; olefin manuf oxidative dehydrogenation alkane; hydrogen carbon oxide manuf alkane oxidn

IT Hydrocarbons, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (C₁-30; reducing substrate for oxidation in absence of mol. oxygen)

IT Alkenes, preparation
 RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PREP (Preparation); PROC (Process)
 (manufacture by oxidative dehydrogenation of alkanes in absence of mol. oxygen)

IT Oxidation catalysts
 (molybdates and/or vanadates for oxidation in absence of mol. oxygen)

IT Dehydrogenation
 (oxidative; for olefin manufacture)

IT Combustion
 Power
 (oxidation in absence of mol. oxygen in combustion for elec. power generation)

IT Water vapor
 (oxygen carrier for oxidation in absence of mol. oxygen)

IT Alkanes, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (reducing substrate for oxidation in absence of mol. oxygen)

IT Oxidation
 (selective; for production of oxidized compds. in absence of mol. oxygen)

IT 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses 7440-57-5, Gold, uses
 RL: CAT (Catalyst use); MOA (Modifier or additive use)
 ; USES (Uses)

(activator for oxidation of molybdate and/or vanadate catalyst
in absence of mol. oxygen)

IT 115-07-1P, Propylene, preparation
RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
engineering or chemical process); PREP (Preparation); PROC (Process)
(manufacture by oxidative dehydrogenation of propane in absence of mol.
oxygen)

IT 1333-74-0P, Hydrogen, preparation
RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical,
engineering or chemical process); PREP (Preparation); PROC (Process)
(manufacture by oxidation in absence of mol. oxygen)

IT 11113-58-9, Cobalt vanadate 13454-70-1, Cerium molybdate
(Ce₂(MoO₄)₃) 13718-70-2, Iron molybdate (FeMoO₄) 13762-14-6,
Cobalt molybdate (CoMoO₄) 14013-15-1, Manganese
molybdate (MnMoO₄) 14177-55-0, Nickel molybdate (NiMoO₄)
15586-37-5, Chromium molybdate (Cr₂(MoO₄)₃) 37220-08-9, Iron
vanadate 39318-26-8, Chromium vanadium oxide 109371-81-5,
Nickel vanadium oxide 151474-27-0, Cobalt molybdenum
nickel oxide ((Co,Ni)MoO₄)
RL: CAT (Catalyst use); CPS (Chemical process); PEP (Physical,
engineering or chemical process); PROC (Process); USES (Uses)
(oxidation in absence of mol. oxygen)

IT 124-38-9, Carbon dioxide, uses 7446-09-5, Sulfur dioxide, uses
7446-11-9, Sulfur trioxide, uses 7732-18-5, Water, uses 11104-93-1,
Nitrogen oxide, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(oxygen carrier for oxidation in absence of mol. oxygen)

IT 74-82-8, Methane, reactions 74-98-6, Propane, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(reducing substrate for oxidation in absence of mol. oxygen)

IT 7440-05-3, Palladium, uses 7440-06-4,
Platinum, uses 7440-16-6, Rhodium, uses
RL: CAT (Catalyst use); MOA (Modifier or additive use)
; USES (Uses)
(activator for oxidation of molybdate and/or vanadate catalyst
in absence of mol. oxygen)

RN 7440-05-3 HCAPLUS
CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-06-4 HCAPLUS
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-16-6 HCAPLUS
CN Rhodium (8CI, 9CI) (CA INDEX NAME)

Rh

L82 ANSWER 32 OF 62 COMPENDEX COPYRIGHT 2005 EEI on STN
AN 2002(50):859 COMPENDEX

TI Experimental and theoretical electron density study of the peroxo function in oxoperoxo(pyridine-2,6-dicarboxylato)(hexamethylphosphoramide)molybdenum(VI): Implications for olefin epoxidation by peroxo transition metal complexes.

AU Macchi, Piero (Dipartimento di CSSI Università degli Studi di Milano, 20133 Milano, Italy); Schultz, A.J.; Larsen, F.K.; Iversen, B.B.

SO Journal of Physical Chemistry A v 105 n 40 Oct 11 2001 2001.p 9231-9242
CODEN: JPFAFH ISSN: 1089-5639

PY 2001

DT Journal

TC Bibliography; Theoretical; Experimental

LA English

AB The relative electrophilicity of different peroxo functions is deduced based on crystal structure correlation analysis and high-level ab initio theoretical calculations on a series of model peroxo compounds. Using electron density analysis, it is shown that peroxo functions in some organic compounds (especially dioxiranes) have a pronounced reversal of polarity resulting in a substantial electrophilic character, while in transition metal peroxides they only have an intermediate electrophilicity. The charge density of a transition metal oxidation catalyst, oxoperoxo(pyridine-2,6-dicarboxylato)(hexamethylphosphoramide)molybdenum(VI), 1, has been determined from combined analysis of 20 K X-ray and neutron diffraction data. The good comparison with results of theoretical calculations (at the HF and B3LYP levels of theory) validates the two approaches and testifies to the suitability of experimental methods even in the presence of heavy atoms. The analysis shows that the Mo-O-oxoperoxo bond contains considerable covalent character as revealed by the short Mo-O distance, the large electron density along the bond path, and the negative energy density. In 1, the O-O distance, the atomic charges, and the electrostatic potential around the peroxo group are different from those of dioxiranes. During a direct interaction with olefins, a substantial repolarization of the group is expected to occur, possibly favored by weaker M-O bonds. 87 Refs.

CC 931.3 Atomic and Molecular Physics; 804.1 Organic Components; 804.2 Inorganic Components; 933.1.1 Crystal Lattice; 801.4 Physical Chemistry; 802.2 Chemical Reactions

CT *Carrier concentration; Crystal structure; Oxidation; Transition metal compounds; Neutron diffraction; Chemical bonds; Catalysts; Olefins

ST Electrophilicity

ET F*H; HF; H cp; cp; F cp; B; Mo; Mo*O; Mo-O; O-O

L82 ANSWER 33 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2001:812664 HCAPLUS

DN 136:92336

ED Entered STN: 08 Nov 2001

TI Electrocatalysis of the oxygen reaction on electrodes prepared using disperse synthetic diamond promoted with cobalt porphyrin and its pyropolymer

AU Zhutaeva, G. V.; Radyushkina, K. A.; Marinich, M. A.; Bogatyreva, G. P.; Tarasevich, M. R.

CS Frumkin Institute of Electrochemistry, Russian Academy of Sciences, Moscow, 117071, Russia

SO Russian Journal of Electrochemistry (Translation of Elektrokimiya) (2001), 37(10), 1059-1064
CODEN: RJELE3; ISSN: 1023-1935

PB MAIK Nauka/Interperiodica Publishing

DT Journal

LA English

- CC 72-2 (Electrochemistry)
Section cross-reference(s): 29, 67
- AB The oxygen electroredn. in acid solns. on electrodes of disperse synthetic diamond powder promoted with cobalt tetra(p-methoxyphenyl)porphyrin or its pyrolysis products is studied. A "floating" gas-diffusion electrode and an RDE of isotropic pyrocarbon are used in expts.; in the latter case, the catalyst is immobilized in a Nafion solution. Two types of diamond, with specific area of 5.8 and 170 m²/g, are used. The results are compared with similar data found for promoted acetylene black. A significant effect of the carbon support on electrocatalytical properties of cobalt porphyrin pyrolyzed on it is found.
- ST oxygen electroredn electrocatalysis diamond disperse electrode cobalt porphyrin pyropolymer
- IT Catalysis
(electrocatalysis; of oxygen reaction on electrodes prepared using disperse synthetic diamond promoted with cobalt porphyrin and its pyropolymer)
- IT Polyoxyalkylenes, uses
RL: NUU (Other use, unclassified); USES (Uses)
(fluorine- and sulfo-containing, ionomers; use for preparation of electrode for oxygen electroredn. in acid solns. on electrodes of disperse synthetic diamond powder promoted with cobalt tetra(p-methoxyphenyl)porphyrin or its pyrolysis products)
- IT Electrodes
(gas-diffusion; use for oxygen electroredn. in acid solns. on electrodes of disperse synthetic diamond powder promoted with cobalt tetra(p-methoxyphenyl)porphyrin or its pyrolysis products)
- IT Cyclic voltammetry
Electrolytic polarization
(of disperse synthetic diamond powder or carbon black promoted with cobalt tetra(p-methoxyphenyl)porphyrin or its pyrolysis products electrodes in H₂SO₄ solution)
- IT Reduction, electrochemical
(of oxygen in acid solns. on electrodes of disperse synthetic diamond powder promoted with cobalt tetra(p-methoxyphenyl)porphyrin or its pyrolysis products)
- IT Thermal decomposition
(oxygen electroredn. in acid solns. on electrodes of disperse synthetic diamond powder promoted with cobalt tetra(p-methoxyphenyl)porphyrin or its pyrolysis products)
- IT Fluoropolymers, uses
RL: NUU (Other use, unclassified); USES (Uses)
(polyoxyalkylene-, sulfo-containing, ionomers; use for preparation of electrode for oxygen electroredn. in acid solns. on electrodes of disperse synthetic diamond powder promoted with cobalt tetra(p-methoxyphenyl)porphyrin or its pyrolysis products)
- IT Ionomers
RL: NUU (Other use, unclassified); USES (Uses)
(polyoxyalkylenes, fluorine- and sulfo-containing; use for preparation of electrode for oxygen electroredn. in acid solns. on electrodes of disperse synthetic diamond powder promoted with cobalt tetra(p-methoxyphenyl)porphyrin or its pyrolysis products)
- IT Electrodes
(rotating disk electrodes; use for oxygen electroredn. in acid solns. on electrodes of disperse synthetic diamond powder promoted with cobalt tetra(p-methoxyphenyl)porphyrin or its pyrolysis products)
- IT Carbon black, uses
RL: DEV (Device component use); USES (Uses)
(synthetic; oxygen electroredn. in acid solns. on electrodes of disperse synthetic diamond powder or carbon black promoted with cobalt

IT tetra(p-methoxyphenyl)porphyrin or its pyrolysis products)
7664-93-9, Sulfuric acid, uses
RL: NUU (Other use, unclassified); USES (Uses)
(cyclic voltammetry of disperse synthetic diamond powder or carbon black promoted with cobalt tetra(p-methoxyphenyl)porphyrin or its pyrolysis products electrodes in H2SO4 solution)

IT 7782-44-7, Oxygen, reactions
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(electroredn. in acid solns. on electrodes of disperse synthetic diamond powder promoted with cobalt tetra(p-methoxyphenyl)porphyrin or its pyrolysis products)

IT 28903-71-1, Cobalt tetra(p-methoxyphenyl)porphyrin
RL: CAT (Catalyst use); MOA (Modifier or additive use)
; USES (Uses)
(oxygen electroredn. in acid solns. on electrodes of disperse synthetic diamond powder promoted with cobalt tetra(p-methoxyphenyl)porphyrin or its pyrolysis products)

IT 7782-40-3, Diamond, uses
RL: DEV (Device component use); USES (Uses)
(synthetic; oxygen electroredn. in acid solns. on electrodes of disperse synthetic diamond powder promoted with cobalt tetra(p-methoxyphenyl)porphyrin or its pyrolysis products)

RE.CNT 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD

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L82 ANSWER 34 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2001:883497 HCAPLUS

DN 136:169962

ED Entered STN: 07 Dec 2001

TI From bifunctional site to metal-proton adduct site in alkane reforming reactions on sulphated-zirconia-supported Pt or Pd or Ir catalysts

AU Demirci, Umit Bilge; Garin, Francois

CS Laboratoire d'Etudes de la Reactivite Catalytique des Surfaces et Interfaces, UMR 7515-CNRS, ECPM, Universite Louis Pasteur, Strasbourg, 67087, Fr.

SO Catalysis Letters (2001), 76(1-2), 45-51

- CODEN: CALBER; ISSN: 1011-372X
 PB Kluwer Academic/Plenum Publishers
 DT Journal
 LA English
 CC 51-6 (Fossil Fuels, Derivatives, and Related Products)
 AB Isomerization reactions of n-heptane, n-octane and n-nonane are studied on sulfated-zirconia-supported 0.2 wt% Pt, Pd or Ir catalysts. Evolutions of isomer selectivity vs. total conversion and reaction temps. are analyzed. When total conversion (αT) is increased, isomer selectivity (%Sisom) is decreased and the slope of the curve %Sisom = f(αT) is more pronounced when the carbon number in the alkane is more important. At isoconversion, around 20%, below 473 K, cracking is favored over isomerization reaction, and above 473 K it is the reverse. Moreover, with n-heptane, when the catalytic reaction occurred at 423 K and at low conversion, $\alpha T \leq 20\%$, we observed a large decrease in the isomer selectivity percentages on Pd/SZ and Ir/SZ compared to Pt/SZ. What is remarkable is that, at this low temperature, both metals are inactive in the carbon-carbon bond rupture. To explain these results the following points are raised: (i) an associative mechanism is proposed for the adsorption step of the alkane involving an agostic intermediate species where the carbon-hydrogen bonds act as ligands to the transition metal centers forming covalent C-H...M systems; and (ii) a metal-proton adduct site, which gathers metallic and acidic sites is suggested. This approach seems to better explain our results than the "traditional" bifunctional mechanism.
- ST bifunctional catalysis metal-proton adduct mechanism alkane reforming reactions; alkane isomerization cracking noble metal sulfated zirconia catalyst; agostic species associative adsorption mechanism bifunctional catalyst alkane reforming
- IT Chemical compounds
 (addition, in associative adsorption mechanism; from bifunctional site to metal-proton adduct site in alkane reforming reactions on sulfated-zirconia-supported Pt or Pd or Ir catalysts)
- IT Adsorption
 (agostic species and associative adsorption mechanism; from bifunctional site to metal-proton adduct site in alkane reforming reactions on sulfated-zirconia-supported Pt or Pd or Ir catalysts)
- IT Bond
 (agostic; from bifunctional site to metal-proton adduct site in alkane reforming reactions on sulfated-zirconia-supported Pt or Pd or Ir catalysts)
- IT Catalysis
 Cracking (reaction)
 Cracking catalysts
 Isomerization
 Isomerization catalysts
 Petroleum refining catalysts
 Petroleum reforming catalysts
 Reaction mechanism
 (from bifunctional site to metal-proton adduct site in alkane reforming reactions on sulfated-zirconia-supported Pt or Pd or Ir catalysts)
- IT 1314-23-4D, Zirconia, sulfated 7439-88-5, Iridium, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses
 RL: CAT (Catalyst use); USES (Uses)
 (from bifunctional site to metal-proton adduct site in alkane reforming reactions on sulfated-zirconia-supported Pt or Pd or Ir catalysts)
- IT 111-65-9, n-Octane, reactions 111-84-2, n-Nonane 142-82-5, n-Heptane, reactions
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)

(from bifunctional site to metal-proton adduct site in alkane reforming reactions on sulfated-zirconia-supported Pt or Pd or Ir catalysts)

RE.CNT 49 THERE ARE 49 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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L82 ANSWER 35 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2001:125877 HCAPLUS

DN 134:214087

ED Entered STN: 21 Feb 2001

TI Kinetic study of oxygen electro-reduction on Ru/Sy(CO)_n based catalyst in 0.5 M H₂SO₄

- AU Duron, S.; Rivera-Noriega, R.; Poillierat, G.; Solorza-Feria, O.
CS Depto. Quimica, CINVESTAV-IPN, Mexico, 07000, Mex.
SO Journal of New Materials for Electrochemical Systems (2001), 4(1), 17-23
CODEN: JMESFQ; ISSN: 1480-2422
PB Journal of New Materials for Electrochemical Systems
DT Journal
LA English
CC 72-2 (Electrochemistry)
AB The kinetics of O₂ reduction was examined on a novel ruthenium-sulfur carbonyl cluster electrocatalyst, synthesized by pyrolysis at 300°. The expts. were performed by steady state measurements in a rotating-ring disk electrode (RRDE) in 0.5 M H₂SO₄ at 25°. For this study the electrocatalyst was supported on carbon paste. A maximum of 5.5% of H₂O₂ is formed at ≈0.3 V vs. SHE. This means that O₂ is mainly reduced to water by a 4-electron pathway. At least 3 ranges of different mechanism could be detected for the O₂ reduction on Ru_xSi(CO)_n. In a first range (0.67-0.35 V) all the 3 principal reactions of the Damjanovic's model with $k_3 \geq k_2$ occur. In the 0.33-0.20 V range an H₂O₂ accumulation is observed, $k_2 > k_3$, and the reaction intermediate is well detected in the ring electrode. In the more cathodic region (0.31-0.03 V) a new range of occurrence of the 3 main reactions appears and the small peroxide quantities are slowly reduced to water. In all the 3 ranges k_1 exceeds k_2 .
ST oxygen electroredn kinetics ruthenium sulfide carbonyl electrode
IT Paste electrodes
(carbon; electroredn. kinetics of oxygen on Ru_xSi(CO)_n-modified carbon paste electrode in H₂SO₄)
IT Reduction kinetics
(electrochem.; of oxygen on Ru_xSi(CO)_n-modified carbon paste electrode in H₂SO₄)
IT Carbonyl complexes
RL: CAT (Catalyst use); FMU (Formation, unclassified); PRP (Properties);
FORM (Formation, nonpreparative); USES (Uses)
(ruthenium; in preparation of Ru_xSi(CO)_n electrocatalyst for electroredn. of oxygen)
IT 7664-93-9, Sulfuric acid, uses
RL: NUU (Other use, unclassified); USES (Uses)
(electroredn. kinetics of oxygen on Ru_xSi(CO)_n-modified carbon paste electrode in)
IT 7704-34-9D, Sulfur, reaction products with dodecacarbonyltriruthenium, uses 15243-33-1D, reaction products with sulfur
RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent); USES (Uses)
(electroredn. kinetics of oxygen on Ru_xSi(CO)_n-modified carbon paste electrode in H₂SO₄)
IT 7782-44-7, Oxygen, properties
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(electroredn. kinetics on Ru_xSi(CO)_n-modified carbon paste electrode in H₂SO₄)
IT 7722-84-1, Hydrogen peroxide, formation (nonpreparative)
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(in electroredn. of oxygen on Ru_xSi(CO)_n-modified carbon paste electrode in H₂SO₄)
IT 7704-34-9, Sulfur, reactions 15243-33-1, Ruthenium carbonyl (Ru₃(CO)₁₂)
RL: RCT (Reactant); RACT (Reactant or reagent)
(in preparation of Ru_xSi(CO)_n electrocatalyst for electroredn. of oxygen)
IT 7440-44-0, Carbon, uses
RL: NUU (Other use, unclassified); USES (Uses)

(paste electrodes; electroredn. kinetics of oxygen on
RuxSy(CO)_n-modified carbon paste electrode in H₂SO₄)

RE.CNT 27 THERE ARE 27 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE

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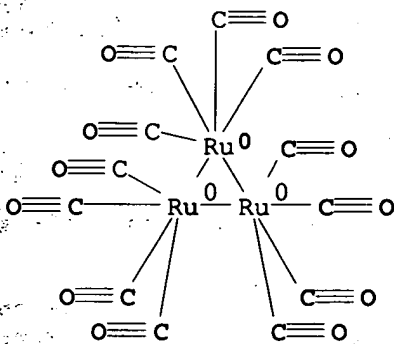
IT 15243-33-1D, reaction products with sulfur

RL: CAT (Catalyst use); PEP (Physical, engineering or chemical
process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent); USES
(Uses)

(electroredn. kinetics of oxygen on RuxSy(CO)_n-modified carbon paste
electrode in H₂SO₄)

RN 15243-33-1 HCAPLUS

CN Ruthenium, dodecacarbonyltri-, triangulo (9CI) (CA INDEX NAME)



L82 ANSWER 36 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2000:441680 HCAPLUS

DN 133:49549

ED Entered STN: 30 Jun 2000

TI Method for making a supported catalyst
 IN Schulz, Robert; Lalande, Guy; Denis, Marie-Chantal; Dodelet, Jean-Pol
 PA Hydro-Quebec, Can.
 SO PCT Int. Appl., 47 pp.
 CODEN: PIXXD2
 DT Patent
 LA French
 IC ICM B01J025-00
 ICS B01J037-06; H01M004-90; H01M004-92; B22F009-16
 CC 67-1 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
 Section cross-reference(s): 52, 72

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2000037173	A1	20000629	WO 1999-CA1165	19991203
W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
US 6239065	B1	20010529	US 1998-218138	19981222
CA 2341610	AA	20000629	CA 1999-2341610	19991203
CA 2341610	C	20040406		
EP 1144111	A1	20011017	EP 1999-957801	19991203
EP 1144111	B1	20020828		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
AT 222804	E	20020915	AT 1999-957801	19991203
JP 2002532247	T2	20021002	JP 2000-589277	19991203
PRAI US 1998-218138	A	19981222		
WO 1999-CA1165	W	19991203		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
WO 2000037173	ICM	B01J025-00
	ICS	B01J037-06; H01M004-90; H01M004-92; B22F009-16
WO 2000037173	ECLA	B22F009/16
US 6239065	NCL	502/337.000; 502/325.000; 502/339.000; 502/344.000; 502/347.000
	ECLA	B22F009/16

AB The invention concerns a method for making a **supported catalyst** with a **nanocryst.** structure and large sp. surface area wherein the first step consists in preparing a nanocryst. material consisting of a metastable composite or alloy of at least two distinct chemical compds. or elements containing at least a catalytic species. The resulting material has a nanocryst. structure with crystals having a size less than 100 nm. The second step consists in subjecting the nanocryst. material to leaching using a so-called leaching solution so as to eliminate partly or completely at least one of the compds. or elements of the material, other than the catalytic species. Advantageously, a non-leachable chemical compound or element acting as support to the catalytic species, such as carbon black, is added to the material in the first step or to the leaching solution in the second step. The use of a non-leachable chemical compound or element enables to further sep. the particles and the nanocrystals and consequently to increase the catalyst active surface. Thus it is possible to decrease the amount of the species having a catalytic function which often is costly.

Said method enables to obtain a catalyst support in the form of a nanocomposite, a solid solution, an intermetallic compound or a combination thereof as the case may be, with a nanocryst. structure and a large sp. surface area usually more than 2 m²/g.

ST making supported electrocatalyst fuel cell platinum metals

IT X-ray diffraction
(by supported catalyst with nanocryst. structure and large surface area)

IT Catalysts
(electrocatalysts; method for making supported catalyst)

IT Nanocrystals
(making supported catalyst with nanocryst. structure)

IT Surface area
(making supported catalyst with nanocryst. structure and large surface area)

IT Carbon black, uses
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(making supported catalyst with nanocryst. structure and large surface area containing)

IT Fuel cells
(making supported catalyst with nanocryst. structure and large surface area for)

IT Leaching
(of metastable composite in making supported catalyst)

IT Electric current-potential relationship
(of polarization in hydrogen atmospheric of supported catalyst with nanocryst. structure and large surface area)

IT Polarization
(of supported catalyst electrode in hydrogen)

IT Surface structure
(of supported catalyst with nanocryst. structure and large surface area)

IT Composites
(preparing nanocryst. material consisting of metastable composite in making supported catalyst)

IT Conducting polymers
Electric conductors, ceramic
Thermal decomposition
(use in making supported catalyst with nanocryst. structure and large surface area)

IT 7647-01-0, Hydrochloric acid, reactions
RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)
(leaching of mixture of Pt/Ru with MgO in making supported catalyst with nanocryst. structure and large surface area)

IT 7440-06-4, Platinum, uses 7440-18-8, Ruthenium, uses
RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(making supported catalyst with nanocryst. structure and large surface area containing)

IT 630-08-0, Carbon monoxide, uses
RL: MOA (Modifier or additive use); PRP (Properties); USES (Uses)
(oxygen reaction with hydrogen in fuel cell with supported catalyst in presence of)

IT 7782-44-7, Oxygen, reactions
RL: PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)

(reaction with hydrogen in fuel cell with supported catalyst)
IT 1333-74-0, Hydrogen, reactions
RL: PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(reaction with oxygen in fuel cell with supported catalyst)
IT 1309-48-4, Magnesia, reactions 7693-27-8, Magnesium hydride
RL: PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(use in making supported catalyst with nanocryst.
structure and large surface area)

RE.CNT 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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- (6) Schultz, R; MATERIALS SCIENCE FORUM 1998, V269-272, P1055

IT 7440-06-4, Platinum, uses 7440-18-8,
Ruthenium, uses
RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(making supported catalyst with nanocryst.
structure and large surface area containing)

RN 7440-06-4 HCAPLUS

CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-18-8 HCAPLUS

CN Ruthenium (8CI, 9CI) (CA INDEX NAME)

Ru

L82 ANSWER 37 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2000:658706 HCAPLUS

DN 134:75087

ED Entered STN: 20 Sep 2000

TI Preparation of carbon nanofibers by the floating catalyst method

AU Ci, L.; Li, Y.; Wei, B.; Liang, J.; Xu, C.; Wu, D.

CS Department of Mechanical Engineering, Tsinghua University, Beijing, 100084, Peop. Rep. China

SO Carbon (2000), 38(14), 1933-1937

CODEN: CRBNAH; ISSN: 0008-6223

PB Elsevier Science Ltd.

DT Journal

LA English

CC 57-8 (Ceramics)

Section cross-reference(s): 78

AB Carbon nanofibers with diams. of 10.apprx.100 nm were produced by the floating catalyst method, which has a high productivity due to its continuous production and has potential applications in industrial engineering. Several exptl. parameters, such as sulfur additives, the evaporating temperature of feedstock (Tbw) and the hydrogen flow amount, have evident

effects on the growth of carbon nanofibers. The samples were observed by transmission electron microscopy. It is shown that only an optimal amount of sulfur in feedstock is needed to obtain filamentous carbon. It is also indicated that the Tbw is a key factor for the production of carbon nanofibers. To obtain thinner, straighter carbon nanofibers, a low Tbw of 205-230°C was needed. The amount of hydrogen flow also plays an important role in the floating catalyst method, and the effect of hydrogen is a complex problem. Our expts. showed that a lower hydrogen flow amount is needed to obtain carbon nanofibers with smaller diam.

- ST carbon nanofiber floating catalyst synthesis property
IT Nanoparticles
Nanostructures
(carbon nanofibers; preparation of carbon nanofibers by the floating catalyst method)
IT Vapor deposition process
(floating catalyst; preparation of carbon nanofibers by the floating catalyst method)
IT Carbon fibers, preparation
RL: PEP (Physical, engineering or chemical process); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(nano-; preparation of carbon nanofibers by the floating catalyst method)
IT 71-43-2, Benzene, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(carbon source; preparation of carbon nanofibers by the floating catalyst method)
IT 1333-74-0, Hydrogen, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(carrier gas; preparation of carbon nanofibers by the floating catalyst method)
IT 7439-89-6, Iron, uses
RL: CAT (Catalyst use); USES (Uses)
(catalyst; preparation of carbon nanofibers by the floating catalyst method)
IT 7704-34-9, Sulfur, uses
RL: MOA (Modifier or additive use); USES (Uses)
(dopant; preparation of carbon nanofibers by the floating catalyst method)
IT 102-54-5, Ferrocene
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(iron source; preparation of carbon nanofibers by the floating catalyst method)
IT 7440-44-0P, Carbon, preparation
RL: PEP (Physical, engineering or chemical process); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(nanofibers; preparation of carbon nanofibers by the floating catalyst method)
IT 110-02-1, Thiophene
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(sulfur source; preparation of carbon nanofibers by the floating catalyst method)

RE.CNT 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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- (2) Ci, L; J Mater Sci Lett 1999, V18, P797 HCAPLUS
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- (6) Ishioka, M; Carbon 1993, V31(1), P123 HCAPLUS
- (7) Jaeger, H; Composites Science and Technology 1994, V51, P231 HCAPLUS
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(12) Tibbetts, G; Carbon 1993, V31(7), P1039 HCAPLUS
(13) Tibbetts, G; Carbon 1994, V32, P569 HCAPLUS
(14) Yang, K; Carbon 1986, V24(6), P687 HCAPLUS
IT 7439-89-6, Iron, uses
RL: CAT (Catalyst use); USES (Uses)
(catalyst; preparation of carbon nanofibers by the floating catalyst method)
RN 7439-89-6 HCAPLUS
CN Iron (7CI, 8CI, 9CI) (CA INDEX NAME)

Fe

IT 7704-34-9, Sulfur, uses
RL: MOA (Modifier or additive use); USES (Uses)
(dopant; preparation of carbon nanofibers by the floating catalyst method)
RN 7704-34-9 HCAPLUS
CN Sulfur (8CI, 9CI) (CA INDEX NAME)

S

L82 ANSWER 38 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2000:860096 HCAPLUS
DN 134:224988
ED Entered STN: 08 Dec 2000
TI Functionalities of a Fe-based catalyst evidenced by TOF-SIMS in relation with the electroreduction of oxygen in polymer electrolyte fuel cells
AU Lefevre, M.; Dodelet, J. -P.; Bertrand, P.
CS INRS-Energie et Materiaux, Varennes, QC, J3X 1S2, Can.
SO Secondary Ion Mass Spectrometry, SIMS XII, Proceedings of the International Conference on Secondary Ion Mass Spectrometry, 12th, Brussels, Belgium, Sept. 5-10, 1999 (2000), Meeting Date 1999, 447-450. Editor(s): Benninghoven, Alfred. Publisher: Elsevier Science B.V., Amsterdam, Neth.
CODEN: 69ARU6
DT Conference
LA English
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 36, 67, 73, 79
AB Fe(II) acetate was adsorbed on perylene tetracarboxylic dianhydride and pyrolyzed in NH3 at various temps. ranging between 400 and 1000 °C in order to vary the catalytic activity. The same samples were analyzed by TOF-SIMS in order to find an eventual trend between some of the detected ions and the catalytic activity and therefore to obtain structural information on the high-temperature catalytic site for oxygen reduction. It is necessary to have C, N, and Fe as well as a high temperature heat-treatment to obtain catalytic activity for O2 reduction. The FeN2C4+ secondary ion is possibly related to the catalytic site (or part of it).
ST catalyst iron polymer electrolyte fuel cell oxygen electroredn SIMS; TOF SIMS catalyst electroredn iron polymer electrolyte fuel cell; surface analysis catalyst electroredn TOF SIMS iron polymer
IT Polymer electrolytes
(fuel cells; functionalities of Fe-based catalyst evidenced by TOF-SIMS in relation with electroredn. of oxygen in polymer electrolyte fuel

- cells)
- IT Carbonization
Heat treatment
Reduction, electrochemical
Reduction catalysts
Surface analysis
TOF-SIMS (time-of-flight secondary-ion mass spectrometry)
(functionalities of Fe-based catalyst evidenced by TOF-SIMS in relation with electroredn. of oxygen in polymer electrolyte fuel cells)
- IT Fuel cells
(polymer electrolyte; functionalities of Fe-based catalyst evidenced by TOF-SIMS in relation with electroredn. of oxygen in polymer electrolyte fuel cells)
- IT Fuel cell electrolytes
(polymer; functionalities of Fe-based catalyst evidenced by TOF-SIMS in relation with electroredn. of oxygen in polymer electrolyte fuel cells)
- IT 7440-44-0P, Carbon, uses
RL: ANT (Analyte); CAT (Catalyst use); PNU (Preparation, unclassified); ANST (Analytical study); PREP (Preparation); USES (Uses)
(catalyst support; functionalities of Fe-based catalyst evidenced by TOF-SIMS in relation with electroredn. of oxygen in polymer electrolyte fuel cells)
- IT 7782-44-7, Oxygen, reactions
RL: PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(electroredn.; functionalities of Fe-based catalyst evidenced by TOF-SIMS in relation with electroredn. of oxygen in polymer electrolyte fuel cells)
- IT 7439-89-6, Iron, uses 17778-38-0, Nitrogen atom, uses
RL: ANT (Analyte); CAT (Catalyst use); MOA (Modifier or additive use); ANST (Analytical study); USES (Uses)
(functionalities of Fe-based catalyst evidenced by TOF-SIMS in relation with electroredn. of oxygen in polymer electrolyte fuel cells)
- IT 3094-87-9, Iron diacetate
RL: ANT (Analyte); CAT (Catalyst use); MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); PRP (Properties); ANST (Analytical study); PROC (Process); USES (Uses)
(functionalities of Fe-based catalyst evidenced by TOF-SIMS in relation with electroredn. of oxygen in polymer electrolyte fuel cells)
- IT 128-69-8, Perylene tetracarboxylic dianhydride
RL: ANT (Analyte); CAT (Catalyst use); PEP (Physical, engineering or chemical process); PRP (Properties); ANST (Analytical study); PROC (Process); USES (Uses)
(functionalities of Fe-based catalyst evidenced by TOF-SIMS in relation with electroredn. of oxygen in polymer electrolyte fuel cells)
- IT 7664-41-7, Ammonia, uses
RL: NUU (Other use, unclassified); USES (Uses)
(functionalities of Fe-based catalyst evidenced by TOF-SIMS in relation with electroredn. of oxygen in polymer electrolyte fuel cells)

RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE

- (1) Appleby, A; Philos Trans R Soc London Ser A 1996, V354, P1681 HCAPLUS
- (2) Claude, E; J Appl Electrochem 1998, V28, P57 HCAPLUS
- (3) Cote, R; J Electrochem Soc 1998, V145, P2411 HCAPLUS
- (4) Faubert, G; Electrochim Acta 1996, V41, P1689 HCAPLUS
- (5) Faubert, G; Electrochimica acta 1999, V44, P2589 HCAPLUS

(6) Gottesfeld, S; Adv Electrochem Sci Eng 1997, V5, P195 HCAPLUS
(7) Parter, K; J Power Sources 1996, V61, P105
(8) van Veen, J; Electrochim Acta 1988, V33, P801 HCAPLUS
(9) Wiesener, K; Electrochim Acta 1986, P1073 HCAPLUS
IT 7440-44-0P, Carbon, uses
RL: ANT (Analyte); CAT (Catalyst use); PNU (Preparation,
unclassified); ANST (Analytical study); PREP (Preparation); USES (Uses)
(catalyst support; functionalities of Fe-based
catalyst evidenced by TOF-SIMS in relation with electroredn. of oxygen
in polymer electrolyte fuel cells)
RN 7440-44-0 HCAPLUS
CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

IT 7439-89-6, Iron, uses
RL: ANT (Analyte); CAT (Catalyst use); MOA (Modifier or
additive use); ANST (Analytical study); USES (Uses)
(functionalities of Fe-based catalyst evidenced by
TOF-SIMS in relation with electroredn. of oxygen in polymer
electrolyte fuel cells)
RN 7439-89-6 HCAPLUS
CN Iron (7CI, 8CI, 9CI) (CA INDEX NAME)

Fe

L82 ANSWER 39 OF 62 JICST-EPlus COPYRIGHT 2005 JST on STN
AN 990753282 JICST-EPlus
TI Experimental Study of Reforming Catalyst on Phosphoric Acid Fuel Cell
Plant.
AU HOTTA KAZUTAKA; OGAWA MASARU
MIYOSHI HIDEAKI; TSURU KIYOSHI
CS Kansai Electr. Power Co., Inc.
Mitsubishi Electr. Corp.
SO Denki Gakkai Ronbunshi. B (Transactions of the Institute of Electrical
Engineers of Japan. B), (1999) vol. 119-B, no. 8/9, pp. 982-987. Journal
Code: S0809A (Fig. 8, Tbl. 6, Ref. 10)
ISSN: 0385-4213
CY Japan
DT Journal; Article
LA Japanese
STA New
AB Hydrogen production of petroleum technology was applied to reforming
technology on PAFC. Pressure of the petroleum plants were not atmospheric
but high. So petroleum technologies could not applied directly PAFC
reforming condition. For this reason, we observed behaviour of catalyst
which is most influenced on reforming ability. Generally, decline of
catalytic ability was caused by three phenomenons: sulfur poisoning,
carbon deposition and sintering. Sulfur poisoning was well known to
decrease catalytic activity, but regeneration methods did not be reported
in detail under PAFC reforming condition yet. And other phenomenons,
carbon deposition and sintering, were prevented by best choice of catalyst
on the market to be suitable for operating conditions. But to be compared
these catalysts with the same condition did not be reported yet, too. For
pressed commercialization of PAFC, we experimented with micro reactor to

- observe regeneration of sulfur poisoned catalysts and to compare of carbon deposition and sintering with two type Ni catalysts under PAFC conditions. And we could observed that best condition of regeneration and influence of catalytic support's compound on carbon deposition and sintering. (author abst.)
- CC YB04040V (621.352.6)
- CT gas fuel cell; steam reforming; desulfurization; precipitation(phase separation); carbon; nickel catalyst; catalytic reforming; sintering; catalytic activity; catalyst degradation; catalyst poison; catalyst deactivation(activity); supported catalyst; phosphoric acid; reaction rate
- BT fuel cell; chemical cell; battery; reforming; gasification; modification; removal; phase separation; separation; second row element; element; carbon group element; transition metal catalyst; metal catalyst; catalyst; petroleum refining; purification; beneficiation of ore; heat treatment; treatment; activity; property; degradation; alteration; variation; phosphorus oxyacid; oxyacid; oxygen compound; oxygen group element compound; phosphorus compound; nitrogen group element compound; velocity
- ST phosphate-type fuel cell; reaction rate constant
- L82 ANSWER 40 OF 62 JICST-EPlus COPYRIGHT 2005 JST on STN
- AN 1000032520 JICST-EPlus
- TI Hydrogenation activity of carbon-supported Mn₂O₃-NiO-H₃PO₄ catalysts.
- AU YAMAMOTO MITSUYOSHI; ZHANG Z-G; YOSHIDA TADASHI
- CS Hokkaido National Ind. Res. Inst.
- SO Nippon Enerugi Gakkai Sekitan Kagaku Kaigi Happyo Ronbunshu, (1999) vol. 36th, pp. 375-378. Journal Code: L1484A (Fig. 4, Tbl. 1, Ref. 4)
- CY Japan
- DT Conference; Article
- LA Japanese
- STA New
- AB The effect of activated carbon as a support for Mn₂O₃-NiO-H₃PO₄ catalyst was studied by using a fixed bed flow reactor under a high hydrogen pressure. By using carbon support, the reaction temperature for the hydrogenation of anthracene was lowered by 50-60.DEG.C. to get the same activity. The H₂-TPD profiles of MNP/AC and MNP/AL catalysts showed that significant amount of hydrogen was adsorbed on MNP/AC, compared to MNP/AL. (author abst.)
- CC XE01050T (66.097)
- CT hydrogenation; polynuclear aromatic hydrocarbon; catalytic activity; supported catalyst; catalyst support; model compound; reaction product; temperature dependence; hydrogen; adsorption; coal liquefaction oil; coal liquefaction; manganese oxide; nickel oxide; phosphoric acid; activated carbon; alumina; olefin compound; alicyclic compound
- BT catalytic reduction; reduction(reaction); chemical reaction; catalytic reaction; polynuclear aromatic compound; aromatic compound; aromatic hydrocarbon; hydrocarbon; activity; property; catalyst; carrier; compound(chemical); product material; dependence; element; synthetic crude oil; petroleum; oils; liquefaction(phase transition); modification; metal oxide; oxide; chalcogenide; oxygen group element compound; oxygen compound; manganese compound; 7A group element compound; transition metal compound; nickel compound; iron group element compound; phosphorus oxyacid; oxyacid; phosphorus compound; nitrogen group element compound; carbon material; inorganic material; material; aluminum oxide; aluminum compound; 3B group element compound
- ST alpha-alumina
- L82 ANSWER 41 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1999:805514 HCAPLUS
DN 132:139065
ED Entered STN: 22 Dec 1999
TI A novel supported catalyst for the carbonylation of methanol
AU Jiang, H.; Liu, Z.; Pan, P.; Yuan, G.
CS Institute of Chemistry, Chinese Academy of Sciences, Beijing, Peop. Rep. China
SO Journal of Molecular Catalysis A: Chemical (1999), 148(1-2), 215-225
CODEN: JMCCF2; ISSN: 1381-1169
PB Elsevier Science B.V.
DT Journal
LA English
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
Section cross-reference(s): 67
AB Porous C beads, prepared from poly(vinylidene chloride) (PVDC), were used as supports for Rh catalysts for carbonylation of MeOH. TEM and STM images show uniform pores spread over the surface of the beads. The optimum temperature for the pyrolysis of PVDC is 1000°. The supports have a sp. surface area of 1000 m²/g with high mech. strength and thermal stability. The average diameter of the pores is 0.8-1.2 nm, which is a suitable size for the Rh catalyst. XPS spectra indicates that covalent bonds are formed between C and Rh in the catalyst. The catalyst exhibits excellent activity and selectivity to MeOAc in MeOH carbonylation. The effects of varying temperature, MeI concentration, Rh content and initial CO partial pressure was examined
ST methanol carbonylation rhodium carbon catalyst; porous carbon bead support rhodium catalyst; acetic acid prepn methanol carbonylation catalyst
IT Carbonylation catalysts
Catalyst supports
(porous C bead support for Rh catalysts for carbonylation of MeOH to AcOH)
IT 9002-85-1, PVDC
RL: RCT (Reactant); RACT (Reactant or reagent);
(carbonization in preparation of porous C bead supports for Rh catalysts for carbonylation of MeOH to AcOH)
IT 74-88-4, Methyl iodide, reactions
RL: RCT (Reactant); RACT (Reactant or reagent);
(porous C bead support for Rh catalysts for carbonylation of MeOH in presence of)
IT 7440-16-6, Rhodium, uses 7440-44-0, Carbon, uses
RL: CAT (Catalyst use); USES (Uses)
(porous C bead support for Rh catalysts for carbonylation of MeOH to AcOH)
IT 64-19-7P, Acetic acid, preparation 79-20-9P, Methyl acetate
RL: IMF (Industrial manufacture); PREP (Preparation)
(porous C bead support for Rh catalysts for carbonylation of MeOH to AcOH)
IT 67-56-1, Methanol, reactions
RL: RCT (Reactant); RACT (Reactant or reagent);
(porous C bead support for Rh catalysts for carbonylation of MeOH to AcOH)
RE.CNT 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
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(5) Fujimoto, K; Ind Eng Chem Prod Res Dev 1982, V21, P429 HCAPLUS

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- (15) Weber, K; Mol Catal 1977, V3, P1
- (16) Yamaseki, K; EP 175818
- IT 7440-16-6, Rhodium, uses
 RL: CAT (Catalyst use); USES (Uses)
 (porous C bead support for Rh catalysts for carbonylation of MeOH to AcOH)
- RN 7440-16-6 HCAPLUS
- CN Rhodium (8CI, 9CI) (CA INDEX NAME)

Rh

L82 ANSWER 42 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1998:169509 HCAPLUS

DN 128:206663

ED Entered STN: 21 Mar 1998

TI Catalyst and process for its manufacture

IN Schlogl, Robert; Wohlers, Michael; Belz, Thilo; Braun, Thomas

PA Max-Planck-Gesellschaft Zur Forderung Der Wissenschaften E.V., Germany;
 Schlogl, Robert; Wohlers, Michael; Belz, Thilo; Braun, Thomas

SO PCT Int. Appl., 22 pp.
 CODEN: PIXXD2

DT Patent

LA German

IC ICM B01J021-18

CC 51-9 (Fossil Fuels, Derivatives, and Related Products)
 Section cross-reference(s): 45, 67

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9809725	A1	19980312	WO 1997-EP4842	19970905
W: JP, US				
RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
DE 19636269	A1	19980312	DE 1996-19636269	19960906
DE 19636269	C2	19991230		
EP 925111	A1	19990630	EP 1997-944838	19970905
EP 925111	B1	20010711		
R: AT, BE, CH, DE, DK, ES, FR, GB, IT, LI, NL, SE, IE, FI				
JP 2000517242	T2	20001226	JP 1998-512252	19970905
AT 202951	E	20010715	AT 1997-944838	19970905
US 2002132863	A1	20020919	US 2002-121728	20020415
US 6653509	B2	20031125		
PRAI DE 1996-19636269	A	19960906		
WO 1997-EP4842	W	19970905		
US 1999-147760	B2	19990504		
US 2000-535748	B3	20000327		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
WO 9809725	ICM	B01J021-18
WO 9809725	ECLA	B01J021/18; C07B031/00; C07C001/04D2
DE 19636269	ECLA	B01J021/18; C07B031/00; C07C001/04D2
US 2002132863	NCL	518/713.000
	ECLA	B01J021/18; C07B031/00; C07C001/04D2

AB The catalyst consists of at ≥ 1 catalytically active metal(s) in a low-valence state on an essentially C substrate. The substrate consists of C which is present in an amorphous state with curved surfaces of the mol. planes which contain non-6-membered C rings, and the catalytically active metal is covalently bonded to the C substrate. The catalyst is produced by vaporizing graphite in an elec. arc between ≥ 2 graphite electrodes in a vacuum apparatus under a nonoxidizing atmospheric The process is carried out (1) in a vacuum apparatus with cooled walls with d.c. or a.c. under a pressure of ≤ 100 Pa and the precipitated product is recovered on the cooled walls, or (2) with d.c. at a pressure of 1 Pa-100 kPa by using arc lengths of 0.1-20 mm, the product which grows on the neg. electrode is recovered, and (3) with a.c. at a pressure of 1 Pa-100 Pa and arc length of 0.1-20 mm, the product which grows on the C electrodes is recovered, and (4) the product obtained from 1, 2, or 3 is recovered with a thermolabile low-valent compound or complex of a catalytically active metal. The catalyst is suitable mainly for hydrogenation of CO and also for liquid-phase hydrogenation of olefins, ketones, and aromatic nitrocompds.

ST amorphous carbon hydrogenation catalyst carrier

IT Fischer-Tropsch catalysts

Hydrogenation catalysts

(with amorphous carbon carrier)

IT 7440-44-0, Carbon, uses

RL: CAT (Catalyst use); USES (Uses)

(amorphous; amorphous carbon as carrier for hydrogenation catalysts)

IT 630-08-0, Carbon monoxide, uses

RL: CAT (Catalyst use); USES (Uses)

(hydrogenation catalyst with amorphous carbon carrier for)

IT 7440-18-8, Ruthenium, uses

RL: CAT (Catalyst use); USES (Uses)

(with amorphous carbon carrier as hydrogenation catalyst)

RE.CNT 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Du Pont; WO 9510481 A 1995 HCAPLUS

(2) Hoechst Ag; DE 4324693 A 1995 HCAPLUS

(3) Vnii Tekhn Ugleroda; GB 2217701 A 1989 HCAPLUS

IT 7440-18-8, Ruthenium, uses

RL: CAT (Catalyst use); USES (Uses)

(with amorphous carbon carrier as hydrogenation catalyst)

RN 7440-18-8 HCAPLUS

CN Ruthenium (8CI, 9CI) (CA INDEX NAME)

Ru

L82 ANSWER 43 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1998:700821 HCAPLUS

DN 130:6893
ED Entered STN: 04 Nov 1998
TI Catalytic behavior of Pd/C in the NOx removal reaction
AU Wang, Xuezhong; Yang, Xiangguang; Wu, Yue
CS Changchun Institute of Applied Chemistry, Changchun, 130022, Peop. Rep. China
SO Reaction Kinetics and Catalysis Letters (1998), 64(2), 309-316
CODEN: RKCLAU; ISSN: 0304-4122
PB Akademiai Kiado
DT Journal
LA English
CC 59-6 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 67
AB The catalytic activity of Pd supported on 2 types of activated C in the reaction of NO + CO and NO alone was studied. The Pd catalyst provides high activity and stability. Different surface properties of activated C led to different activity.
ST palladium catalyzed removal nitrogen oxide; activated carbon supported palladium catalyst; carbon monoxide catalytic removal nitrogen oxide
IT Air purification
(temperature, catalyst pretreatment, support properties, and carbon monoxide effect on catalytic behavior of activated carbon-supported palladium in removal of nitrogen oxides from air)
IT 7440-05-3, Palladium, uses
RL: CAT (Catalyst use); USES (Uses)
(activated carbon-supported; temperature, catalyst pretreatment, support properties, and carbon monoxide effect on catalytic behavior of activated carbon-supported palladium in removal of nitrogen oxides from air)
IT 7440-44-0, Carbon, uses
RL: CAT (Catalyst use); USES (Uses)
(palladium supported on activated; temperature, catalyst pretreatment, support properties, and carbon monoxide effect on catalytic behavior of activated carbon-supported palladium in removal of nitrogen oxides from air)
IT 124-38-9, Carbon dioxide, processes 7727-37-9, Nitrogen, processes 10024-97-2, Nitrous oxide, processes
RL: FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); FORM (Formation, nonpreparative); PROC (Process)
(temperature, catalyst pretreatment, support properties, and carbon monoxide effect on catalytic behavior of activated carbon-supported palladium in removal of nitrogen oxides from air)
IT 630-08-0, Carbon monoxide, uses
RL: MOA (Modifier or additive use); USES (Uses)
(temperature, catalyst pretreatment, support properties, and carbon monoxide effect on catalytic behavior of activated carbon-supported palladium in removal of nitrogen oxides from air)
IT 10102-43-9, Nitric oxide, processes 11104-93-1, Nitrogen oxide, processes
RL: PEP (Physical, engineering or chemical process); POL (Pollutant); REM (Removal or disposal); OCCU (Occurrence); PROC (Process)
(temperature, catalyst pretreatment, support properties, and carbon monoxide effect on catalytic behavior of activated carbon-supported palladium in removal of nitrogen

oxides from air)

RE.CNT 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE

- (1) Funabika, M; Catal Today 1991, V10, P33
- (2) Gao, Z; Chinese J Applied Chem 1996, V13, P77 HCAPLUS
- (3) Gao, Z; Chinese Science Bull 1996, V41, P787
- (4) Gao, Z; React Kinet Catal Lett 1996, V59, P359 HCAPLUS
- (5) Green, T; J Chem Soc 1926, V128, P1790
- (6) Kasahara, K; Shokubai 1994, V36, P601 HCAPLUS
- (7) Kobylinski, T; J Catal 1974, V33, P376 HCAPLUS
- (8) Salas-Peregrin, M; Appl Catal B 1996, V8, P79 HCAPLUS

IT 7440-05-3, Palladium, uses

RL: CAT (Catalyst use); USES (Uses)

(activated carbon-supported; temperature, catalyst pretreatment, support properties, and carbon monoxide effect on catalytic behavior of activated carbon-supported palladium in removal of nitrogen oxides from air)

RN 7440-05-3 HCAPLUS

CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

IT 7440-44-0, Carbon, uses

RL: CAT (Catalyst use); USES (Uses)

(palladium supported on activated; temperature, catalyst pretreatment, support properties, and carbon monoxide effect on catalytic behavior of activated carbon-supported palladium in removal of nitrogen oxides from air)

RN 7440-44-0 HCAPLUS

CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

L82 ANSWER 44 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1998:708044 HCAPLUS

DN 130:56271

ED Entered STN: 09 Nov 1998

TI Low-temperature selective catalytic reduction of NOx by metal oxides supported on active carbon fibers

AU Yoshikawa, Masaaki; Yasutake, Akinori; Mochida, Isao

CS R and D Department, Osaka Gas Co. Ltd., Konohana-ku, Torishima, Osaka, 554, Japan

SO Applied Catalysis, A: General (1998), 173(2), 239-245

CODEN: ACAGE4; ISSN: 0926-860X

PB Elsevier Science B.V.

DT Journal

LA English

CC 59-4 (Air Pollution and Industrial Hygiene)

Section cross-reference(s): 66, 67

AB Selective catalytic reduction (SCR) of NOx at 323-423 K, a relatively lower temperature than that in conventional SCR methods using V2O5/TiO2-anatase catalyst, was studied. Catalytic components examined were transition-metal oxides supported on pitch-based active carbon fibers

- (ACF). Three transition-metal oxides, Fe_2O_3 , Co_2O_3 , and Mn_2O_3 were tested as catalytic components; Mn_2O_3 demonstrated the best activity among these metal oxides. As a support material, ACF showed the highest effect among 3 support materials, including granular active carbon (GAC) and $\gamma\text{-Al}_2\text{O}_3$. Mn_2O_3 /ACF catalyst activity increased in proportion to reaction temperature; NO conversion was 92% at 423 K. ACF contributed to make highly dispersed metal oxide particles and large gas-contact surface area.
- ST selective catalytic redn flue gas nitrogen oxide; ammonia selective catalytic redn nitrogen oxide; vanadia titania catalyzed nitrogen oxide redn; transition metal oxide supported redn catalyst; activated carbon fiber catalyst support; alumina redn catalyst support; granular activated carbon redn catalyst support
- IT Carbon fibers, uses
RL: CAT (Catalyst use); USES (Uses)
(catalyst supported by active; low-temperature, selective catalytic reduction of flue gas nitrogen oxides by ammonia over transition metal oxides supported on active carbon fibers)
- IT Surface area
(catalyst; low-temperature, selective catalytic reduction of flue gas nitrogen oxides by ammonia over transition metal oxides supported on active carbon fibers)
- IT Flue gases
Reduction catalysts
(low-temperature, selective catalytic reduction of flue gas nitrogen oxides by ammonia over transition metal oxides supported on active carbon fibers)
- IT Transition metal oxides
RL: CAT (Catalyst use); USES (Uses)
(low-temperature, selective catalytic reduction of flue gas nitrogen oxides by ammonia over transition metal oxides supported on active carbon fibers)
- IT 7440-44-0, Carbon, uses
RL: CAT (Catalyst use); USES (Uses)
(catalyst supported by granulated activated; low-temperature, selective catalytic reduction of flue gas nitrogen oxides by ammonia over transition metal oxides supported on active carbon fibers)
- IT 1344-28-1, Alumina, uses
RL: CAT (Catalyst use); USES (Uses)
(catalyst supported by; low-temperature, selective catalytic reduction of flue gas nitrogen oxides by ammonia over transition metal oxides supported on active carbon fibers)
- IT 1308-04-9, Cobalt oxide (Co_2O_3) 1309-37-1, Iron oxide (Fe_2O_3), uses 1317-34-6, Manganese oxide (Mn_2O_3)
RL: CAT (Catalyst use); USES (Uses)
(low-temperature, selective catalytic reduction of flue gas nitrogen oxides by ammonia over transition metal oxides supported on active carbon fibers)
- IT 7727-37-9, Nitrogen, processes
RL: FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); FORM (Formation, nonpreparative); PROC (Process)
(low-temperature, selective catalytic reduction of flue gas nitrogen oxides by ammonia over transition metal oxides supported on active carbon fibers)
- IT 7664-41-7, Ammonia, reactions
RL: MOA (Modifier or additive use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(low-temperature, selective catalytic reduction of flue gas nitrogen oxides by ammonia over transition metal oxides)

supported on active carbon fibers)

IT 10102-43-9, Nitric oxide, processes 11104-93-1, Nitrogen oxide, processes
RL: PEP (Physical, engineering or chemical process); POL (Pollutant); REM (Removal or disposal); OCCU (Occurrence); PROC (Process)
(low-temperature, selective catalytic reduction of flue gas nitrogen oxides by ammonia over transition metal oxides supported on active carbon fibers)

IT 1314-62-1, Vanadia, uses
RL: CAT (Catalyst use); USES (Uses)
(titania and; low-temperature, selective catalytic reduction of flue gas nitrogen oxides by ammonia over transition metal oxides supported on active carbon fibers)

IT 13463-67-7, Titania, uses
RL: CAT (Catalyst use); USES (Uses)
(vanadia and; low-temperature, selective catalytic reduction of flue gas nitrogen oxides by ammonia over transition metal oxides supported on active carbon fibers)

RE.CNT 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE

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(2) Briggs, D; Practical Surface Analysis 2nd ed 1990
(3) de Boer, M; New Developments in Selective Oxidation by Heterogeneous Catalysis 1992, P133 HCAPLUS
(4) Kaneko, K; Langmuir 1989, V5, P960 HCAPLUS
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(10) Wollner, A; Appl Catal A 1993, V94, P181
(11) Wood, S; Chem Eng Progr 1994, V90(1), P32 HCAPLUS

IT 7440-44-0, Carbon, uses
RL: CAT (Catalyst use); USES (Uses)
(catalyst supported by granulated activated; low-temperature, selective catalytic reduction of flue gas nitrogen oxides by ammonia over transition metal oxides supported on active carbon fibers)

RN 7440-44-0 HCAPLUS
CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

L82 ANSWER 45 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1998:248392 HCAPLUS
DN 128:278332
ED Entered STN: 01 May 1998
TI A hydrogen selective gas sensor from highly oriented films of carbon, obtained by fracturing charcoal
AU Miremadi, Bijan K.; Colbow, Konrad
CS Department of Physics, Simon Fraser University, Burnaby, BC, V5A 1S6, Can.
SO Sensors and Actuators, B: Chemical (1998), B46(1), 30-34
CODEN: SABCEB; ISSN: 0925-4005
PB Elsevier Science S.A.
DT Journal
LA English
CC 79-2 (Inorganic Analytical Chemistry)

AB Single layer carbon film was produced to fabricate a highly selective hydrogen sensor by depositing a partially crystalline carbon film from a single layer suspension onto an alumina substrate. The deposited carbon film, which has a hexagonal-turbostratic structure with an interlayer spacing of (d002) 3.58 A, show high orientation with intense (001) Bragg diffraction lines in their x-ray diffraction patterns. When the deposited films were promoted with catalysts selected from Pt-group metals, a covalent Pt-C bond is formed between highly dispersed Pt particles and the unsatd. dangling carbon bonds at the edges and/or at dislocation sites. These catalyst particles are responsible for the dissociation of hydrogen mols. and subsequent electron donation to the conduction band, resulting in high sensitivity and selectivity hydrogen gas sensors. At a temperature of 110°, the sensor's response to hydrogen is linear in concentration up to 103 ppm, with a 15-30 s response time and a 20-60 s recovery time. The lower operating temperature enhances safety when dealing with hydrogen gas.

ST hydrogen gas sensor oriented carbon film; fracturing charcoal oriented carbon film sensor

IT Charcoal
RL: PEP (Physical, engineering or chemical process); PROC (Process) (activated; hydrogen selective gas sensor from highly oriented films of carbon, obtained by fracturing charcoal)

IT Films
Gas sensors
(hydrogen selective gas sensor from highly oriented films of carbon, obtained by fracturing charcoal)

IT Platinum-group metals
RL: ARU (Analytical role, unclassified); CAT (Catalyst use); DEV (Device component use); ANST (Analytical study); USES (Uses)
(hydrogen selective gas sensor from highly oriented films of carbon, obtained by fracturing charcoal)

IT Ceramics
(substrates; hydrogen selective gas sensor from highly oriented films of carbon, obtained by fracturing charcoal)

IT 1333-74-0, Hydrogen, analysis
RL: ANT (Analyte); ANST (Analytical study)
(hydrogen selective gas sensor from highly oriented films of carbon, obtained by fracturing charcoal)

IT 1344-28-1, Alumina, analysis 7440-44-0, Carbon, analysis
RL: ARU (Analytical role, unclassified); DEV (Device component use); ANST (Analytical study); USES (Uses)
(hydrogen selective gas sensor from highly oriented films of carbon, obtained by fracturing charcoal)

RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE

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- (2) Kaneko, H; US 5503728 1996 HCAPLUS
- (3) Maire, J; Carbon 1968, V6, P555 HCAPLUS
- (4) Miremadi, B; Appl Phys A 1996, V63, P271
- (5) Miremadi, B; J Appl Phys 1989, V63, P4970
- (6) Miremadi, B; J Appl Phys 1990, V67, P1515 HCAPLUS
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- (9) Miremadi, B; J Catal 1991, V131, P127 HCAPLUS
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- (11) Renschler, C; J Mater Res 1989, V4(2), P452 HCAPLUS
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L82 ANSWER 46 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1997:375222 HCAPLUS

DN 127:55245
 ED Entered STN: 16 Jun 1997
 TI Rejuvenated catalytic oxidation of wastewater for removing cyanide and sulfur compounds
 IN Yan, Tsoung Y.
 PA Mobil Oil Corp., USA
 SO U.S., 12 pp., Cont.-in-part of U.S. 5,338,463.
 CODEN: USXXAM
 DT Patent
 LA English
 IC ICM C02F001-72
 INCL 210763000
 CC 60-2 (Waste Treatment and Disposal)
 FAN.CNT 4

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 5635078	A	19970603	US 1994-227749	19940413
	CA 2180719	AA	19951026	CA 1995-2180719	19950221
	WO 9528357	A1	19951026	WO 1995-US2148	19950221
	W: AU, CA, JP				
	RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	AU 9518802	A1	19951110	AU 1995-18802	19950221
	AU 688004	B2	19980305		
	EP 755363	A1	19970129	EP 1995-911066	19950221
	R: BE, DE, ES, FR, GB, IT, NL				
	JP 09511944	T2	19971202	JP 1995-526951	19950221
	US 5552063	A	19960903	US 1995-515773	19950816
PRAI	US 1993-61127	A2	19930512		
	US 1994-227749	A	19940413		
	WO 1995-US2148	W	19950221		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
US 5635078	ICM	C02F001-72
	INCL	210763000
US 5635078	NCL	210/763.000; 210/903.000; 210/904.000; 210/908.000
US 5552063	NCL	210/763.000; 210/908.000; 210/909.000

AB The rejuvenating catalytic oxidation of offensive substances, such as cyanides, sulfides, sulfites, thiosulfates, mercaptans, disulfides, ammonia and mixts. thereof, contained in wastewater is described. The process involves the addition of a low concentration of a metal compound to the wastewater to be treated and then passing the wastewater along with a source of oxygen over an adsorbent material, thus catalytically oxidizing the offensive substances contained in the waste water. The process reduces the catalytic impact of the loss of metal from the adsorbent material due to leaching and allows the catalyst to be rejuvenated and allows recovery from process upsets in the treating system without unit shutdown and catalyst replacement. An example of the catalytic support is activated carbon and an example of the metal is copper.

ST catalytic oxidn wastewater treatment cyanide removal

IT Wastewater treatment

(oxidation, catalytic; rejuvenated catalytic oxidation of wastewater for removing cyanide and sulfur compds.)

IT Wastewater treatment

(oxidation; rejuvenated catalytic oxidation of wastewater for removing cyanide and sulfur compds.)

IT Zeolite-group minerals

Zeolites (synthetic), uses

RL: CAT (Catalyst use); USES (Uses)

(rejuvenated catalytic oxidation of wastewater for removing cyanide and sulfur compds.)

IT Cyanides (inorganic), processes
RL: REM (Removal or disposal); PROC (Process)
(rejuvenated catalytic oxidation of wastewater for removing cyanide and sulfur compds.)

IT Sulfides, processes
RL: REM (Removal or disposal); PROC (Process)
(rejuvenated catalytic oxidation of wastewater for removing cyanide and sulfur compds.)

IT Thiols (organic), processes
RL: REM (Removal or disposal); PROC (Process)
(rejuvenated catalytic oxidation of wastewater for removing cyanide and sulfur compds.)

IT 7440-44-0, Carbon, uses
RL: NUU (Other use, unclassified); USES (Uses)
(activated, adsorbent; rejuvenated catalytic oxidation of wastewater for removing cyanide and sulfur compds.)

IT 1344-28-1, Alumina, uses 7439-89-6, Iron, uses
7439-96-5, Manganese, uses 7439-98-7, Molybdenum, uses
7440-02-0, Nickel, uses 7440-05-3,
Palladium, uses 7440-06-4, Platinum, uses
7440-22-4, Silver, uses 7440-33-7, Tungsten, uses 7440-48-4,
Cobalt, uses 7440-50-8, Copper, uses 7631-86-9, Silica, uses
RL: CAT (Catalyst use); USES (Uses)
(rejuvenated catalytic oxidation of wastewater for removing cyanide and sulfur compds.)

IT 3251-23-8, Cupric nitrate
RL: MOA (Modifier or additive use); USES (Uses)
(rejuvenated catalytic oxidation of wastewater for removing cyanide and sulfur compds.)

IT 7446-09-5, Sulfur dioxide, processes 7722-84-1, Hydrogen peroxide, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(rejuvenated catalytic oxidation of wastewater for removing cyanide and sulfur compds.)

IT 7664-41-7, Ammonia, processes
RL: REM (Removal or disposal); PROC (Process)
(rejuvenated catalytic oxidation of wastewater for removing cyanide and sulfur compds.)

IT 7439-89-6, Iron, uses 7439-96-5,
Manganese, uses 7440-02-0, Nickel, uses
7440-05-3, Palladium, uses 7440-06-4,
Platinum, uses 7440-48-4, Cobalt, uses
RL: CAT (Catalyst use); USES (Uses)
(rejuvenated catalytic oxidation of wastewater for removing cyanide and sulfur compds.)

RN 7439-89-6 HCAPLUS
CN Iron (7CI, 8CI, 9CI) (CA INDEX NAME)

Fe

RN 7439-96-5 HCAPLUS
CN Manganese (8CI, 9CI) (CA INDEX NAME)

Mn

RN 7440-02-0 HCAPLUS
CN Nickel (8CI, 9CI) (CA INDEX NAME)

Ni

RN 7440-05-3 HCAPLUS
CN Palladium (8CI, 9CI) (CA INDEX NAME)

Pd

RN 7440-06-4 HCAPLUS
CN Platinum (8CI, 9CI) (CA INDEX NAME)

Pt

RN 7440-48-4 HCAPLUS
CN Cobalt (8CI, 9CI) (CA INDEX NAME)

Co

L82 ANSWER 47 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1998:246043 HCAPLUS
DN 128:247775
ED Entered STN: 30 Apr 1998
TI Low temperature oxidation of CO over supported PdCl₂-CuCl₂ catalysts
AU Koh, Dong Jun; Song, Jae Hwal; Ham, Sung-Won; Nam, In-Sik; Chang, Rae-Woong; Park, Eun Duck; Lee, Jae Sung; Kim, Young Gul
CS Research Institute of Industrial Science & Technology (RIST)/Department of Chemical Engineering, School of Environmental Engineering, Environmental Catalysis Research Team, Pohang University of Science and Technology (POSTECH), Pohang, 790-330, S. Korea
SO Korean Journal of Chemical Engineering (1997), 14(6), 486-490
CODEN: KJCHE6; ISSN: 0256-1115
PB Korean Institute of Chemical Engineers
DT Journal
LA English
CC 59-4 (Air Pollution and Industrial Hygiene)
AB PdCl₂-CuCl₂ catalyst supported on activated carbon was examined for the low temperature oxidation of CO. The catalyst developed in the present study was active and stable at ambient conditions if water were existing in the feed gas stream. The addition of Cu(NO₃)₂ into the PdCl₂-CuCl₂ catalyst significantly enhanced the CO oxidation activity. X-ray diffraction study revealed that the role of Cu(NO₃)₂ was to stabilize active Cu(II) species, Cu₂Cl(OH)₃, on the catalyst surface which maintains the redox property of palladium. When HCl and SO₂ were also existing in the feed, they easily inactivated the catalyst. It was found that HCl and SO₂ inhibited the formation of active Cu(II) species on the catalyst surface.
ST carbon monoxide oxidn catalyst palladium copper; exhaust flue carbon monoxide oxidn catalyst

- IT Exhaust gases (engine)
Flue gases
Oxidation catalysts
(low temperature oxidation of CO over supported PdCl₂-CuCl₂ catalysts for flue and exhaust treatment)
- IT 7446-09-5, Sulfur dioxide, uses
RL: MOA (Modifier or additive use); USES (Uses)
(catalyst surface modification by; low temperature oxidation of CO over supported PdCl₂-CuCl₂ catalysts for flue and exhaust treatment)
- IT 7647-01-0, Hydrochloric acid, miscellaneous
RL: MSC (Miscellaneous)
(catalyst surface modification by; low temperature oxidation of CO over supported PdCl₂-CuCl₂ catalysts for flue and exhaust treatment)
- IT 7447-39-4, Copper dichloride, uses 7647-10-1, Palladium dichloride
RL: CAT (Catalyst use); USES (Uses)
(low temperature oxidation of CO over supported PdCl₂-CuCl₂ catalysts for flue and exhaust treatment)
- IT 630-08-0, Carbon monoxide, processes
RL: POL (Pollutant); REM (Removal or disposal); OCCU (Occurrence); PROC (Process)
(low temperature oxidation of CO over supported PdCl₂-CuCl₂ catalysts for flue and exhaust treatment)

RE.CNT 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD

- RE
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 - (5) Fuller, M; J C S Chem Comm 1973, P210 HCAPLUS
 - (6) Haruta, M; J Catal 1993, V144, P175 HCAPLUS
 - (7) Imamura, S; J Catal 1995, V151, P279 HCAPLUS
 - (8) Kim, K; Appl Catal:B 1994, V5, P103 HCAPLUS
 - (9) Lee, C; Bull Korean Chem Soc 1995, V16(3), P296 HCAPLUS
 - (10) Lee, J; Appl Catal:B 1996, V7, P199 HCAPLUS
 - (11) Lloyd, W; US 3790662 1974 HCAPLUS
 - (12) Lloyd, W; Environ Sci Technol 1971, V5(11), P1133 HCAPLUS
 - (13) Oh, S; J Catal 1991, V128, P526 HCAPLUS
 - (14) Tanielyan, S; Appl Catal:A 1992, V85, P73 HCAPLUS
 - (15) Yao, Y; J Catal 1984, V87, P152 HCAPLUS
 - (16) Yarparpalvi, R; Ind Eng Chem Res 1991, V30, P2219 HCAPLUS

L82 ANSWER 48 OF 62 COMPENDEX COPYRIGHT 2005 EEI on STN

AN 1997(16):797 COMPENDEX

TI High-performance, low Pt content catalysts for the electroreduction of oxygen in polymer-electrolyte fuel cells.

AU Fournier, J. (IMI-NRC, Boucherville, Que, Can); Faubert, G.; Tilquin, J.Y.; Cote, R.; Guay, D.; Dodelet, J.P.

SO Journal of the Electrochemical Society v 144 n 1 Jan 1997.p 145-154
CODEN: JESQAN ISSN: 0013-4651

PY 1997

DT Journal

TC Experimental

LA English

AB Pt-included and Pt-supported catalysts have been synthesized using graphite and carbon black

supports of various specific areas. The graphites are KS6 (20 m²/g), HS100 (110 m²/g), and HS300 (305 m²/g) from Lonza, and the carbon blacks are Vulcan (254 m²/g) and Black Pearls (1475 m²/g) from Cabot. The

Pt-included and Pt-supported catalysts were used at the cathode of a H₂/O₂ fuel cell, and their polarization curves were compared to each other and to those of various Pt-supported catalysts from E-TEK. In the high current region of interest to fuel cell developers, it is shown that Pt-supported catalysts perform better than Pt-included ones when the specific area of the support is small. The contrary is true when the specific area of the support is large. The best catalysts are HS300-Pti left bracket 8.3 weight percent (w/o) Pt included in HS300 graphite right bracket and Vu-Pti (6.1 w/o Pt included in Vulcan XC-72R). These catalysts display very high mass and specific activities for O₂ reduction. Furthermore, the iR-corrected polarization curves of both HS300-Pti (with a Pt loading of 0.110 mg/cm²) and Vu-Pti (with a Pt loading of 0.070 mg/cm²) cross at high current the polarization curve of the electrode prepared with E-TEK20 (20 w/o of supported Pt, with a Pt loading of 0.287 mg/cm²). Pt inclusion in graphite or carbon black is therefore an interesting way of reducing the Pt loading of fuel cell cathodes without lowering electro-chemical performance. HS300-Pti and Vu-Pti have been characterized by x-ray diffraction, transmission electron microscopy, and x-ray photoelectron spectroscopy. These analyses indicate that they both contain metallic Pt and Pt(II and IV) oxides and/or hydroxides. (Author abstract) 44 Refs.

CC 801.4.1 Electrochemistry; 802.2 Chemical Reactions; 803 Chemical Agents; 547.1 Precious Metals; 702.2 Fuel Cells; 815.1 Polymeric Materials

CT *Electrochemistry; Graphite; Oxygen; Platinum; Fuel cells; Solid electrolytes; Polymers; Synthesis (chemical); Reduction; Catalysts

ST Electroreduction; Polymer electrolyte fuel cells

ET Pt; H₂S; HS; H cp; cp; S cp; H₂; O₂; I*Pt; Pt(II; Pt cp; I cp

L82 ANSWER 49 OF 62 JICST-EPlus COPYRIGHT 2005 JST on STN

AN 970616072 JICST-EPlus

TI Hydrodesulfurization Activity of Carbon-Supported CoMo Catalysts for Refractory Sulfur-Containing Compounds.

AU HAMDY F; SAKANISHI K; MOCHIDA I

CS Kyushu Univ.

SO Sekiyu Gakkai Nenkai Koen Yoshi, (1997) vol. 40th, pp. 23-24. Journal Code: L2066A (Fig. 1, Tbl. 2, Ref. 6)

CY Japan

DT Conference; Short Communication

LA English

STA New

AB Catalysts were prepared by impregnation of Co and Mo in 2 types of carbon by hydrodesulfurization of dibenzothiophene (DBT) and 4, 6 - dimethyl DBT(4, 6-DMDBT) was carried out in the autoclave at 340.DEG.C. and 2.9MPa. The carbon supported Co-Mo catalyst showed higher activity than a commercially available catalyst. Catalyst activity and selectivity of the desulfurization route varied according to carbon type and preparation method.

CC YF02050E; CB06110P (665.66; 544.478.05)

CT hydrodesulfurization; supported catalyst; cobalt compound; molybdenum compound; carbon; model compound; catalytic activity; reaction path; sulfur heterocyclic compound; polynuclear aromatic compound
BT desulfurization; removal; catalyst; iron group element compound; transition metal compound; 6A group element compound; second row element; element; carbon group element; compound(chemical); activity; property; route; heterocyclic compound; aromatic compound

L82 ANSWER 50 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1999:304299 HCAPLUS
 DN 130:302288
 ED Entered STN: 19 May 1999
 TI Preparation of gas-solid phase carbonylation catalyst
 IN Jiang, Dazhi; Li, Xiaobao; Tian, Shizhong; Zhu, Lixing; Lou, Yinxiang
 PA Chemistry Institute, Chinese Academy of Sciences, Peop. Rep. China
 SO Faming Zhuanli Shenqing Gongkai Shuomingshu, 15 pp.
 CODEN: CNXXEV
 DT Patent
 LA Chinese
 IC ICM B01J035-10
 ICS B01J032-00; B01J023-46; C07B041-06; C07C051-12
 CC 67-1 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	CN 1115689	A	19960131	CN 1995-103039	19950331
	CN 1037585	B	19980304		
PRAI	CN 1995-103039		19950331		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
CN 1115689	ICM	B01J035-10
	ICS	B01J032-00; B01J023-46; C07B041-06; C07C051-12

AB The catalyst with double pores (35-65 Å and 150-350 Å, resp.) consists of Rh or Rh/rare earth elements on C composite supports. The specific area of the catalyst is 500-800 m²/g, and the contents of Rh and rare earth(s) are 0.1-1.0 and 0-3.5 weight% of the support, resp. The catalyst is prepared by (1) preparation of composite material by filling inorg. fibers into polymer resin or pitch at weight ratio of 0.5-1.5; or by inclusion of inorg. fibers in polymer by polycondensation or polyaddn. of monomer, (2) carbonizing particles of composite material in Ar or N at 900° for 2-4 h, and surface-treatment by introducing aqueous vapor or CO₂ to obtain the support, and (3) loading the support with Rh salt, e.g., RhCl₃ or Rh salt/rare earth(s) such as chloride or nitrate of La, Ce, and Nd, preferably in the presence of 5-10% surfactant, reduction with H at 400° for 1-2 h, or reduction with formaldehyde at room temperature for 0.5-2 h, drying, and calcination at 600° for 1-3 h. The inorg. fibers are C, SiC, Si₃N₄ or their mixts.; the polymer resins are phenolic resin, furfural resin, urea resin, homopolymer or copolymer of vinyl monomer such as acrylonitrile, and natural or synthetic macromol. material. The surfactant is, preferably, polyglycol-p-alkylphenyl ether, such as polyglycol-p-octylphenyl ether. The catalyst is used to manufacture acetic acid (or Et acetate) by carbonylation of methanol.

ST carbonylation catalyst gas solid phase prepn; rhodium catalyst

IT carbonylation gas solid phase

IT Carbonylation catalysts

(preparation of gas-solid phase carbonylation catalyst)

IT 10024-93-8, Neodymium chloride 10045-95-1, Neodymium nitrate
 10049-07-7, Rhodium trichloride 10099-58-8, Lanthanum chloride
 10099-59-9, Lanthanum nitrate 10108-73-3, Cerous nitrate 10139-58-9,
 Rhodium trinitrate 10361-80-5, Praseodymium nitrate

RL: CAT (Catalyst use); USES (Uses)

(preparation of gas-solid phase carbonylation catalyst)

IT 67-56-1, Methanol, reactions 115-10-6, Dimethyl ether 630-08-0, Carbon monoxide, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(preparation of gas-solid phase carbonylation catalyst)

IT 64-19-7P, Acetic acid, preparation 141-78-6P, Ethyl acetate, preparation
 RL: SPN (Synthetic preparation); PREP (Preparation)

(preparation of gas-solid phase carbonylation catalyst)
IT 50-00-0, Formaldehyde, uses
RL: MSC (Miscellaneous); NUU (Other use, unclassified); USES (Uses)
(reducing agent; preparation of gas-solid phase carbonylation catalyst)
IT 409-21-2, Silicon carbide, uses 12033-89-5, Silicon nitride, uses
RL: CAT (Catalyst use); USES (Uses)
(support, resin filler; preparation of gas-solid phase carbonylation catalyst)
IT 7440-44-0, Carbon, uses
RL: CAT (Catalyst use); USES (Uses)
(support; preparation of gas-solid phase carbonylation catalyst)
IT 9002-93-1, Poly(ethylene glycol) p-octylphenyl ether
RL: MOA (Modifier or additive use); USES (Uses)
(surfactant; preparation of gas-solid phase carbonylation catalyst)
IT 7440-44-0, Carbon, uses
RL: CAT (Catalyst use); USES (Uses)
(support; preparation of gas-solid phase carbonylation catalyst)
RN 7440-44-0 HCAPLUS
CN Carbon (7CI, 8CI, 9CI) (CA INDEX NAME)

C

L82 ANSWER 51 OF 62 COMPENDEX COPYRIGHT 2005 EBI on STN
AN 1996(30):2096 COMPENDEX
TI Kinetic modeling of multiple steady-states for the oxidation of aqueous ethanol with oxygen on a carbon supported platinum catalyst.
AU Jelemensky, L. (Univ of Technology, Eindhoven, Neth); Kuster, B.F.M.; Marin, G.B.
MT Proceedings of the 1996 14th International Symposium on Chemical Reaction Engineering: From Fundamentals to Commercial Plants and Products, ISCRE 14. Part A.
ML Brugge, Belgium
MD 05 May 1996-08 May 1996
SO Chemical Engineering Science v 51 n 10 pt A May 1996.p.1767-1776
CODEN: CESCAC ISSN: 0009-2509
PY 1996
MN 44735
DT Journal
TC Theoretical
LA English
AB Multiple steady-states data were used for the construction of a kinetic model for the oxidation of aqueous ethanol with oxygen on a carbon supported platinum catalyst. A model, incorporating reversible creation of oxygen adatoms on the catalyst surface from surface hydroxyl as well as reversible formation of subsurface oxygen from oxygen adatoms, could describe quantitatively all the observations. It was essential that the reaction rate coefficients for the formation of atomic and subsurface oxygen strongly depend on the corresponding degrees of coverage introducing positive and negative feedback features. (Author abstract) Refs.
CC 802.2 Chemical Reactions; 921.6 Numerical Methods; 804.1 Organic Components; 804.2 Inorganic Components; 547.1 Precious Metals; 931.2 Physical Properties of Gases, Liquids and Solids
CT *Reaction kinetics; Surfaces; Catalyst selectivity; Ethanol; Oxygen; Catalysts; Platinum; Carbon; Mathematical

- models; Oxidation
- ST Multiple steady states; Kinetic model; Hydroxyl; Adatoms; Subsurface oxygen formation
- L82 ANSWER 52 OF 62 COMPENDEX COPYRIGHT 2005 EEI on STN
- AN 1997(14):5131 COMPENDEX
- TI Removal of no over carbon supported copper catalysts:
II. Evaluation of catalytic properties under different reaction conditions.
- AU Marquez-Alvarez, C. (CSIC, Madrid, Spain); Rodriguez-Ramos, I.; Guerrero-Ruiz, A.
- SO Carbon v 34 n 12 1996.p 1509-1514
CODEN: CRBNAH ISSN: 0008-6223
- PY 1996
- DT Journal
- TC Experimental
- LA English
- AB The copper-catalysed reduction of NO with CO has been investigated over copper-loaded carbon materials (graphites and activated carbon). The NO plus CO reaction has been studied in the presence and in the absence of oxygen. The carbon-supported copper catalysts have a very high activity for the reduction of NO with CO; however, the presence of oxygen inhibits the reaction. Variations in catalytic activity are associated with changes in the chemical nature of the of the active sites. Carbonaceous materials are found to stabilize metallic copper under NO plus CO reaction conditions. The presence of functional groups on the surface of the carbon and the porous structure affect the performance of the catalysts. The reduction of NO with carbon is enhanced by the presence of O₂, although the activity for this reaction is very low compared with those for the NO plus CO or CO plus O₂ reactions. (Author abstract) 25 Refs.
- CC 804.2 Inorganic Components; 803 Chemical Agents; 544.1 Copper; 802.2 Chemical Reactions; 802.3 Chemical Operations
- CT *Carbon; Impregnation; Reduction; Nitrogen oxides; Carbon monoxide; Catalyst activity; Porous materials; Surfaces; Catalysts; Copper
- ST Carbon supported catalysts; Catalytic properties; Reactivity
- ET N*O; NO; N cp; cp; O cp; C*O; CO; C cp; O₂
- L82 ANSWER 53 OF 62 JICST-EPlus COPYRIGHT 2005 JST on STN
- AN 960837013 JICST-EPlus
- TI Oxidative acetoxylation of p-xylene over supported-Pd catalysts: Effect of Au addition on catalytic activity, selectivity and stability.
- AU MATSUKATA MASAHIKO; TANII HIDEKAZU; UHEYAMA KOREKAZU
- CS Osaka Univ., Fac. of Eng. Sci.
- SO Shokubai (Catalysts & Catalysis), (1996) vol. 38, no. 6, pp. 498-501.
Journal Code: F0319A (Fig. 4; Tbl. 3; Ref. 5)
CODEN: SHKUAJ; ISSN: 0559-8958
- CY Japan
- DT Journal; Short Communication
- LA Japanese
- STA New
- AB Oxidative acetoxylation of p-xylene was carried out at 5atm of O₂ and 150.DEG.C. in liquid phase and a batch-wise manner. It was found that though silica and activated carbon were proper carriers of Pd, activated carbon gave a more active and selective catalysts than silica. Activated carbon played roles of keeping

Pd at a proper oxidized form and of immobilizing Pd on its surface. The catalytic activity and selectivity of Pd/C were improved by the addition of Au because the oxidizing state of Pd was optimized by a addition of Au. Pd became further immobilized tightly on the surface of activated carbon by the addition of Au. A combination of FE-TEM and EDAX was very powerful for analyzing the nano structures and the chemical compositions of PdAu ultrafine particles supported on activated carbon. It was concluded that Pd-Au alloy particles in the range of 5-20nm was formed but they are aggregates of nano-structures having ununiform chemical compositions. (author abst.)

CC CB06122I (544.478-03:546.9+546.5!)

CT palladium catalyst; supported catalyst; activated carbon; silica; gold; additive effect; catalytic oxidation; catalytic activity; selectivity; dissolution; X-ray photoelectron spectrum; electron microscopy; energy dispersive X-ray spectrometry; alloying; nanostructure; surface structure; acetoxylation; alkylbenzene

BT transition metal catalyst; metal catalyst; catalyst; carbon material; inorganic material; material; silicon dioxide; silicon oxide; silicon compound; carbon group element compound; oxide; chalcogenide; oxygen group element compound; oxygen compound; 1B group element; transition metal; metallic element; element; effect; oxidation; chemical reaction; catalytic reaction; activity; property; photoelectron spectrum; spectrum; microscopy; observation and view; X-ray spectrometry; X-ray analysis; instrumental analysis; analysis(separation); analysis; spectrochemical analysis; modification; structure; acyloxylation; substitution reaction; exchange reaction; aromatic hydrocarbon; hydrocarbon; aromatic compound

L82 ANSWER 54 OF 62 COMPENDEX COPYRIGHT 2005 EEI on STN

AN 1995(2):181 COMPENDEX

TI Oxygen reduction catalysed by carbon supported iridium-chelates.

AU Bouwkamp-Wijnoltz, A.L. (Eindhoven Univ of Technology, Eindhoven, Neth); Visscher, W.; van Veen, J.A.R.

SO Electrochimica Acta v 39 n 11-12 Aug 1994.p 1641-1645

CODEN: ELCAAV ISSN: 0013-4686

PY 1994

DT Journal

TC Experimental

LA English

AB Carbon supported iridium-octaethylporphyrin (IrOEP), iridium-tetraphenylporphyrin (IrTPP) and iridium-phthalocyanine (IrPc) were studied in acid for the oxygen reduction. Both porphyrins give a four-electron reduction, although a peculiar deactivation at low potentials occurs. At IrPc and heat treated porphyrins hydrogen peroxide is formed. Results are compared with carbon monoxide oxidation experiments at these catalysts. A single site mechanism is proposed for the oxygen reduction mechanism. (Author abstract) 26 Refs.

CC 802.2 Chemical Reactions; 801.1 Chemistry (General); 804.2 Inorganic Components; 803 Chemical Agents

CT *Reduction; Catalysts; Carbon; Acids; Pyrolysis;

Hydrogen peroxide; Carbon monoxide; Oxidation; Oxygen; Catalysis

ST Oxygen reduction; Floating electrode system; Rotating ring disc technique; Porphyrins; Iridium chelates; Deactivation

ET Ir*P*T; IrTPP; Ir cp; cp; T cp; P cp

L82 ANSWER 55 OF 62 COMPENDEX COPYRIGHT 2005 EEI on STN

AN 1993(33):705 COMPENDEX

TI Effect of surface oxygen groups of carbon

supports on the characteristics of Pd/C catalysts.

- AU Suh, Dong Jin (Korea Inst of Science and Technology, Seoul, South Korea);
Park, Tae-Jin; Ihm, Son-Ki
SO Carbon v 31 n 3 1993.p 427-435
CODEN: CRBNAH ISSN: 0008-6223
PY 1993
DT Journal
TC Experimental
LA English
AB The effect of surface oxygen groups on the properties of carbon-supported palladium catalysts for liquid-phase hydrogenation of dinitrotoluene has been investigated. Activated carbons and carbon black were subjected to oxidative treatments in order to introduce surface oxygen groups. The surface oxygen groups were characterized by acid-base titrations, TPD of the decomposition products (CO and CO₂), and infrared spectroscopy. Palladium on carbon catalysts were prepared with these carbons by alkali hydrolysis and liquid-phase reduction, and the palladium dispersion was determined from pulsed oxygen titration measurements. The palladium dispersion increased with the increasing amount of surface oxygen groups, but the catalytic activity did not improve proportionally, probably due to more uniform distribution of palladium particles into the smaller pores. The catalytic activity may be explained by metal dispersion, metal location throughout the entire pore structure, and surface nature of the support. In addition, the surface oxygen groups were found to play an important role in hydrogen adsorption/titration on the palladium surface, thus facilitating the hydrogen spillover even at low temperatures. (Author abstract) 22 Refs.
- CC 804.2 Inorganic Components; 803 Chemical Agents; 931.2 Physical Properties of Gases, Liquids and Solids; 802.2 Chemical Reactions
CT *Carbon; Characterization; Catalysts; Surface properties; Hydrogenation; Catalyst supports
ST Surface oxygen groups; Carbon supports; Palladium-carbon catalysts
ET C*O; CO; C cp; cp; O cp; CO₂; Pd
- L82 ANSWER 56 OF 62 COMPENDEX COPYRIGHT 2005 EEI on STN
AN 1993(25):80535 COMPENDEX
TI Influence of support and metallic precursor on the hydrogenation of p-chloronitrobenzene over supported platinum catalysts.
- AU Coq, Bernard (CNRS, Montpellier, Fr); Tijani, Amina; Dutarte, Roger; Figueras, Francois
SO Journal of Molecular Catalysis v 79 n 1-3 Feb 15 1993.p 253-264
CODEN: JMCADS ISSN: 0304-5102
PY 1993
DT Journal
TC Experimental
LA English
AB Hydrogenation of p-chloronitrobenzene (CNB) has been studied, in methanol suspension, at 303 K and atmospheric pressure, over alumina, magnesia, titania and graphite supported platinum catalysts. The catalysts were prepared by using anionic, cationic or organometallic platinum precursors. The nature of the precursor does not modify markedly the catalytic properties of platinum for that reaction. However, the inhibiting effect of p-chloroaniline (CAN), the main product formed on CNB hydrogenation is the highest on Pt/Al₂O₃ prepared from the cationic precursor. For similar sizes of the Pt particles, the greatest influence on activity and selectivity is observed when titania is used as carrier. There is a tenfold increase of

turnover frequency on Pt/TiO₂ compared to Pt/Al₂O₃. At high CNB conversion (greater than 98%), the yield of CAN increases from 85.2% on Pt/Al₂O₃ to 99.3% on Pt/TiO₂ reduced at high temperature (773 K). The improvement of CAN selectivity stems mainly from enhancement of the relative reactivity between hydrogenation of the nitro group and hydrogenolysis of the C-Cl bond of CAN. It is proposed that the migration of suboxide TiO_x species (x less than 2) on to the Pt particles, in a strong metal/support interaction state, is responsible for this behaviour. A schematic model of the reaction site is presented, in which the migrating TiO_x adspecies on Pt activate the N equals O bond which becomes highly susceptible to hydrogen attack. (Author abstract) 19 Refs.

CC 804.1 Organic Components; 802.2 Chemical Reactions; 803 Chemical Agents; 931.2 Physical Properties of Gases, Liquids and Solids
 CT *Aromatic compounds; Graphite; Catalysts; Platinum compounds; Catalyst supports; Alumina; Magnesia; Titanium oxides; Hydrogenation; Catalysis
 ST Catalysts precursors; Chloronitrobenzenes; Supported platinum catalysts; Heterogeneous catalysis; Molecular catalysis
 ET Pt; Al*O; Al₂O₃; Al cp; cp; O cp; O*Ti; TiO₂; Ti cp; C*Cl; C-Cl; TiO_x; N; O

L82 ANSWER 57 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN
 AN 1993:147769 HCAPLUS
 DN 118:147769
 ED Entered STN: 13 Apr 1993
 TI Preparation of silica modified on surface by hydrosilanes, as chromatography supports
 IN Guy, Felix; Meiouet, Faiza
 PA Societe Francaise Chromato Colonne, Fr.
 SO Fr. Demande, 20 pp.
 CODEN: FRXXBL

DT Patent
 LA French
 IC ICM B01J020-10
 ICS G01N030-48; G01N031-00; C01B033-04; B01D015-08
 CC 29-6 (Organometallic and Organometalloidal Compounds)
 Section cross-reference(s): 80

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	FR 2666999	A1	19920327	FR 1990-11822	19900925
	FR 2666999	B1	19930813		
PRAI	FR 1990-11822		19900925		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
FR 2666999	ICM	B01J020-10
	ICS	G01N030-48; G01N031-00; C01B033-04; B01D015-08

OS MARPAT 118:147769

AB The preparation of silica supports modified on the surface by grafting of covalently bonded groups, i.e., by silanization of silica with organohydrosilanes (e.g., octylsilane, PhSiMe₂H) in the presence of a catalyst [e.g., Ru₃(CO)₁₂], is claimed with 5 examples. The silyl groups may contain alkyl or aryl groups, or a mixture of both. The process forms grafted derivs., i.e., silylated at the silica hydroxyl surface, at a level 20% above conventional products. Only H₂ is released from the reaction process, unlike other processes that release byproducts which destabilize the substituent-support bonds. These supports may be used in anal. chromatog. or preparative solid/liquid extraction, in heterogeneous

catalysis, or in capillary electrophoresis.

ST silica silylation hydrosilane; chromatog support silylated silica

IT Silylation
(of silica with hydrosilanes)

IT Chromatography
(supports, silica modified on surface by hydrosilanes)

IT 15243-33-1, Triruthenium dodecacarbonyl
RL: CAT (Catalyst use); USES (Uses)
(catalyst, for silylation of silica with hydrosilanes)

IT 766-77-8DP, silica derivative 871-92-1DP, silica derivative 32395-58-7DP,
silica derivative 40934-68-7DP, silica derivative 80204-10-0DP, silica derivative
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of, as chromatog. support)

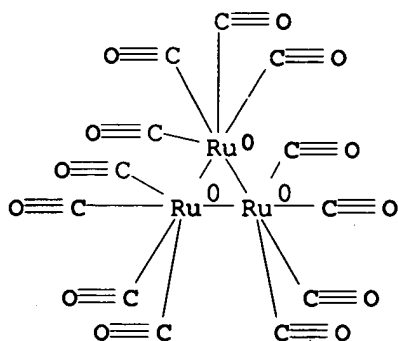
IT 766-77-8, Dimethylphenylsilane 871-92-1, Octylsilane 32395-58-7,
Dimethyloctadecylsilane 40934-68-7, Dimethyloctylsilane 80204-10-0,
Methyloctylsilane
RL: RCT (Reactant); RACT (Reactant or reagent)
(silylation by, of silica)

IT 7631-86-9, Silica, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(silylation of, with hydrosilanes)

IT 15243-33-1, Triruthenium dodecacarbonyl
RL: CAT (Catalyst use); USES (Uses)
(catalyst, for silylation of silica with hydrosilanes)

RN 15243-33-1 HCAPLUS

CN Ruthenium, dodecacarbonyltri-, triangulo (9CI) (CA INDEX NAME)



L82 ANSWER 58 OF 62 JICST-EPlus COPYRIGHT 2005 JST on STN

AN 920460945 JICST-EPlus

TI Preparation of Hydrosulfurization Catalysts with High Activity.

AU AKAI YOSHIO
OKAMOTO YASUAKI

CS Idemitsu Kosan Co., Ltd., Central Res. Lab.
Osaka Univ., Faculty of Engineering Science

SO Shokubai (Catalysts & Catalysis), (1992) vol. 34, no. 4, pp. 236-240.
Journal Code: F0319A (Fig. 4, Tbl. 1, Ref. 39)
CODEN: SHKUJ; ISSN: 0559-8958

CY Japan

DT Journal; Commentary

LA Japanese

STA New

AB Recent progress in the preparation methods of
hydrosulfurization (HDS) catalysts with high activity has been discussed.
The carbon-supported "Co-Mo-S"

catalyst was prepared by pore volume impregnation using an aqueous solution containing Co, Mo and nitrilotriacetic acid (NTA). This method results in a highly active HDS catalyst in which **cobalt** exclusively present in the form "Co-Mo-S". Furthermore, several papers of the impregnation methods using organic acids such as citric acid and malic acid have been reported. However, the structures of Co and Mo in the impregnation solutions, especially solutions involving organic acids, are quite limited. Thus, further studies are required to clarify the structures of Co and Mo in these solutions. (author abst.)

- CC CB06110P (544.478.05)
CT desulfuration; catalyst; **cobalt**; molybdenum; alumina; **nickel** catalyst; supported catalyst; additive effect; nitride; molybdenum compound; carbide; catalyst support; catalytic activity; transition metal catalyst; preparation(material); aliphatic amine; aliphatic carboxylic acid; aliphatic alcohol
BT elimination reaction; chemical reaction; desulfurization; removal; fourth row element; element; **iron** group element; transition metal; metallic element; 6A group element; aluminum oxide; aluminum compound; 3B group element compound; metal oxide; oxide; chalcogenide; oxygen group element compound; oxygen compound; metal catalyst; effect; nitrogen compound; nitrogen group element compound; 6A group element compound; transition metal compound; carbon compound; carbon group element compound; carrier; activity; property; amine; carboxylic acid; alcohol; hydroxy compound
L82 ANSWER 59 OF 62 COMPENDEX COPYRIGHT 2005 EEI on STN
AN 1992(5):241 COMPENDEX DN 920557938
TI Substrate selectivity by the polymer support in hydrogenation over crosslinked polymer-immobilized **metal catalysts**.
AU Toshima, Naoki (Univ of Tokyo, Tokyo, Jpn); Ohtaki, Michitaka; Teranishi, Toshiharu
MT 5th International Conference on Polymer Supported Reactions in Organic Chemistry.
ML Kyoto, Jpn
MD 24 Sep 1990-28 Sep 1990
SO Reactive Polymers v 15 Nov 1991.p 135-145
CODEN: REPLEN ISSN: 0923-1137
PY 1991
MN 15978
DT Journal
TC Experimental; Application
LA English
AB Metal clusters were immobilized on crosslinked polymers by two methods. One is the immobilization of polymer-protected platinum or rhodium clusters by **covalent bond** formation between the protective polymer and the crosslinked polymer support. The immobilization was attributed to the formation of amide bonds by the reaction of methyl acrylate residues of the protective polymer with amino groups of the aminoethylated polyacrylamide gel. In the other method, palladium clusters were immobilized on chelate resin-metal complexes by reduction of palladium ions supported on the resin complexes which are characterised by high porosity. In this case the chelate resin works as both the support and as the protective polymer of the clusters. Both the immobilized **metal** clusters preferably **catalyzed** the hydrogenation of C equals C bonds in hydrophilic substrates, in particular the substrate containing a carboxyl group. This substrate selectivity can be explained by the acid-base interaction between the substrate and the polymer support. (Author abstract) 15 Refs.
CC 803 Chemical Agents & Basic Industrial Chemicals; 804 Chemical Products;

815 Plastics & Polymeric Materials; 816 Plastics, Plant Equipment & Processes

CT *CATALYSTS:Selectivity; ORGANOMETALLICS:Complexation; POLYMERS:Crosslinking; OLEFINS:Hydrogenation; POLYAMIDES:Chelation; POLYACRYLATES:Gelation

ST POLYACRYLAMIDE GELS; IMMOBILIZED CATALYSTS; TRANSITION METAL COMPLEX CATALYSTS; SUBSTRATE SELECTIVITY; POLYMER SUPPORTED CATALYSTS

ET C

L82 ANSWER 60 OF 62 COMPENDEX COPYRIGHT 2005 EEI on STN

AN 1987(1):4956 COMPENDEX DN 87014828; *8756283

TI CORRELATION BETWEEN THE PROPERTIES OF METAL ATOMS AND THE EXCHANGE CURRENT DENSITIES OF HYDROGEN ELECTRODES.

AU Moizhes, B.Ya.

SO Sov Electrochem v 23 n 3 Mar 1986 p 362-364

CODEN: SOECAI ISSN: 0038-5387

PY 1986

DT Journal

TC Theoretical; Experimental

LA English

AB The hydrogen evolution reaction in water has long been used as a model for studying phenomena of electrocatalysis. The most convenient characteristic of the reaction rate is the exchange current density (i_0). The experimental data for i_0 in acidic media were previously analyzed and the results of that work is used by the author. A discussion is presented of the two-electron mechanism of reaction. It is known that Pt and other group-VIII metals are effective catalysts, not only for the hydrogen evolution reaction but also for the oxygen evolution reaction where two-electron models are widely discussed. Therefore, the suggested ability of Pt to function as a two-electron donor (or acceptor) can explain the high activity of platinum in many electrochemical reactions. Possibly the same explanation holds for the high catalytic activity which is displayed by platinum, not only in electrochemical but also in many chemical redox reactions associated with the rupture of covalent two-electron bonds. 13 refs.

CC 804 Chemical Products; 801 Chemical Analysis & Physical Chemistry; 704 Electric Components & Equipment; 803 Chemical Agents & Basic Industrial Chemicals

CT *HYDROGEN; CATALYSTS; ELECTROCHEMISTRY; ELECTRODES

ST DIELECTRIC PERMITTIVITY; BOLTZMAN EXPONENT; TWO-ELECTRON MECHANISM; ACTIVATED COMPLEXES

ET Pt

L82 ANSWER 61 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1969:100088 HCAPLUS

DN 70:100088

ED Entered STN: 12 May 1984

TI Photocatalysis on semiconductors supported on metals. IV. Photosensitized carbon monoxide oxidation on cobalt oxide (Co3O4) supported on silver

AU Steinbach, Friedrich

CS Univ. of Pennsylvania, Philadelphia, PA, USA

SO Zeitschrift fuer Physikalische Chemie (Muenchen, Germany) (1968), 61(5-6), 235-46

CODEN: ZPCFAX; ISSN: 0044-3336

DT Journal

LA German

CC 67 (Catalysis and Reaction Kinetics)

AB The electron distribution in a Co3O4 catalyst layer <1000 A. thick, is

altered by Ag-support and by uv irradiation. The activation energy of CO-oxidation on Co₃O₄ was measured for 4 catalyst systems, Co₃O₄ and Co₃O₄/Ag in light and dark. The measured activation energies were related to changes of the distance between Fermi potential and valence band, as given by the theories of photocond. and photovoltaic effect. The results strongly support the dependence earlier found for the activation energy of CO-oxidation on NiO and ZnO with and without support. The covalent lattice of the Co₃O₄ contained Co(III) and 6 octahedrally surrounded O atoms which are bound by covalent bonds. Co(II) ions are incorporated into tetrahedrons formed between the covalent octahedrons. The catalytic properties and their variation by illumination and metal support are interpreted qual. by the bond properties of the proposed covalent lattice model.

ST cobalt oxide catalyst; silver supported Co oxide; photocatalysis; carbon monoxide oxidn

IT Oxidation catalysts

(cobalt oxide, for carbon monoxide)

IT Electron configuration

(of cobalt oxide catalysts, for oxidation of carbon monoxide)

IT Activation energy of oxidation

(photochem., of carbon monoxide, catalytic)

IT Oxidation

(photochem., of carbon monoxide, mechanism of catalytic)

IT 7440-22-4, uses and miscellaneous

RL: CAT (Catalyst use); USES (Uses)

(catalysts from cobalt oxide and, for oxidation of carbon monoxide)

IT 1308-06-1

RL: CAT (Catalyst use); USES (Uses)

(catalysts from silver and, for oxidation of carbon monoxide)

IT 630-08-0, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(oxidation of, cobalt oxide catalysts for)

L82 ANSWER 62 OF 62 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1967:29154 HCAPLUS

DN 66:29154

ED Entered STN: 12 May 1984

TI Pseudocationic polymerization

AU Plesch, Peter H.

CS Univ. Keele, Keele, UK

SO Polymer Preprints (American Chemical Society, Division of Polymer Chemistry) (1966), 7(2), 492-4

CODEN: ACPPAY; ISSN: 0032-3934

DT Journal

LA English

CC 35 (Synthetic High Polymers)

AB Conductimetric and spectroscopic evidence showed that in the polymerization of styrene by HClO₄ in CH₂Cl₂ and (CH₂Cl)₂ the concentration of ions during polymerization was <10⁻⁶M. This type of polymerization was called pseudocationic and the present paper assembles the evidence supporting the view that in these and other, related polymerizations the chain carriers are not free or paired ions. This view is unaffected by the validity of our theory that the active species is an ester, and it does not depend on the interpretation the uv spectrum which the reaction mixts. develop at the end of the polymerization. The evidence for pseudocationic reactions is (1) kinetic: rate laws, d.p. dependences, and activation energies; (2) chemical: nil effect of water on rate, sequestration of acid during polymerization, copolymerization, different behavior of isobutene and styrene in identical systems; (3) physical:

effect of dielec. constant of solvent, effect of high dielec. constant field on reaction rate. Probably most cationic polymerizations of aromatic monomers are in fact pseudocationic, but many more systems need to be studied in detail from this point of view. The ester mechanism provides an interpretation in terms of an insertion reaction which is the counterpart of pseudoanionic polymerizations in which the active end is a covalent C-metal bond. 17 references.

ST STYRENE POLYMNS; POLYMNS STYRENE; CATIONIC POLYMNS; PSEUDOCATIONIC POLYMNS
IT Polymerization

(cationic, (pseudo-), of styrene, mechanism of)

IT Polymerization catalysts

(perchloric acid as, for styrene)

IT 9003-53-6P, preparation

RL: PREP (Preparation)

(catalysts for pseudocationic, perchloric acid as)

IT 7601-90-3, uses and miscellaneous

RL: CAT (Catalyst use); USES (Uses)

(catalysts, for polymerization of styrene)

=>

effect of dielec. constant of solvent, effect of high dielec. constant field on reaction rate. Probably most cationic polymerizations of aromatic monomers are in fact pseudocationic, but many more systems need to be studied in detail from this point of view. The ester mechanism provides an interpretation in terms of an insertion reaction which is the counterpart of pseudoanionic polymerizations in which the active end is a **covalent C-metal bond**. 17 references.

ST STYRENE POLYMNS; POLYMNS STYRENE; CATIONIC POLYMNS; PSEUDOCATIONIC POLYMNS
 IT Polymerization
 (cationic, (pseudo-), of styrene, mechanism of)
 IT Polymerization catalysts
 (perchloric acid as, for styrene)
 IT 9003-53-6P, preparation
 RL: PREP (Preparation)
 (catalysts for pseudocationic, perchloric acid as)
 IT 7601-90-3, uses and miscellaneous
 RL: **CAT (Catalyst use)**; **USES (Uses)**
 (catalysts, for polymerization of styrene)

=> => FILE INSPEC

FILE 'INSPEC' ENTERED AT 13:13:09 ON 02 DEC 2005

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 FILE COVERS 1969 TO DATE.

<<< SIMULTANEOUS LEFT AND RIGHT TRUNCATION AVAILABLE IN
 THE BASIC INDEX >>>

=> D QUE L93

L43 7255 SEA FILE=WPIX ABB=ON (CARRIER? OR SUPPORT?) (4A) (CARBON OR GRAPHITE OR NANO?)
 L44 1103076 SEA FILE=WPIX ABB=ON (PT OR PLATINUM OR RU OR RUTHENIUM OR MN OR MANGANESE OR IRON OR FE OR CO OR COBALT OR NI OR NICKEL OR RH OR RHODIUM OR PD OR PALLADIUM OR RH OR RHENIUM OR IR OR IRIIDIUM)
 L45 3173 SEA FILE=WPIX ABB=ON L43 AND L44
 L83 41 SEA FILE=INSPEC ABB=ON L45 AND (S OR SULFUR OR P OR PHOSPHORUS OR O OR OXYGEN OR N OR NITROGEN) (4A) CATALY?
 L84 18 SEA FILE=INSPEC ABB=ON METAL? (2A) COVALENT? (2A) (CARBON OR C OR GRAPHITE? OR NANO?)
 L85 1 SEA FILE=INSPEC ABB=ON COVALENT? (2A) BOND? AND METAL? (3A) CATALY ?
 L87 7549 SEA FILE=INSPEC ABB=ON CATALYSTS+NT/CT
 L88 30 SEA FILE=INSPEC ABB=ON L83 AND L87
 L89 14 SEA FILE=INSPEC ABB=ON L88 AND CARBON+NT/CT
 L90 0 SEA FILE=INSPEC ABB=ON L84 AND L87
 L91 14 SEA FILE=INSPEC ABB=ON L89 OR L90
 L92 0 SEA FILE=INSPEC ABB=ON L85 AND L87
 L93 14 SEA FILE=INSPEC ABB=ON L91 OR L92

=> D L93 ALL 1-14

L93 ANSWER 1 OF 14 INSPEC (C) 2005 IEE on STN
 AN 2005:8616887 INSPEC DN A2005-24-8230-003
 TI Synthesis, characterization, and hydrotreating activity of **carbon**
 -**supported** transition metal phosphides.

AU Yuying Shu; Oyama, S.T. (Dept. of Chem. Eng., Virginia Polytech. Inst. & State Univ., Blacksburg, VA, USA)

SO Carbon (June 2005) vol.43, no.7, p.1517-32. 43 refs.
Doc. No.: S0008-6223(05)00082-5
Published by: Elsevier
CODEN: CRBNAH ISSN: 0008-6223
SICI: 0008-6223(200506)43:7L:1517:SCHA;1-F

DT Journal

TC Experimental

CY United Kingdom

LA English

AB A series of **nickel**, molybdenum, and tungsten metal phosphides deposited on a **carbon black support** (Ni2P/C, MoP/C, and WP/C) were synthesized by means of temperature-programmed reduction. The samples were characterized by BET surface area, CO uptake, X-ray diffraction (XRD), elemental analysis, and extended X-ray absorption fine structure (EXAFS) measurements. The activity of these catalysts was measured at 613 K and 3.1MPa in a three-phase, packed-bed reactor for hydrodesulfurization (HDS) and hydrodenitrogenation (HDN) with a model liquid feed containing 500 ppm sulfur as 4,6-dimethyldibenzothiophene (4,6-DMDBT), 3000 ppm sulfur as dimethyl disulfide, and 200 ppm nitrogen as quinoline. The Ni2P/C catalyst was found to exhibit the best hydroprocessing performance based on equal CO chemisorption sites (70 μmol) loaded in the reactor. An optimum Ni loading for HDS and HDN activity was found as 1.656 mmolg⁻¹ (11.0 weight% Ni2P) which gave an HDS conversion of 99% and an HDN conversion of 100% at a molar space velocity of 0.88 h⁻¹. These were much higher than those of a commercial **Ni-Mo-S/ gamma -Al2O3 catalyst** which gave an HDS conversion of 68 % and an HDN conversion of 94 %, and a previously reported best Ni2P/SiO2 catalyst which gave an HDS conversion of 76 % and an HDN conversion of 92 %. The use of carbon instead of silica as a support gave rise to other differences, which included smaller particle size, higher CO uptake, lessened retention of P on the support, and reduced sulfur deposition. The stability of the 11.0 weight% Ni2P/C catalyst was also excellent with no deactivation observed over 110h of time on stream. The activity and stability of the Ni2P/C catalyst were affected by the phosphorous content, both reaching a maximum with an initial Ni/P ratio of 1/2. EXAFS and elemental analysis of the spent samples indicated the formation of a surface phosphosulfide phase on the Ni2P, which was beneficial for hydrotreating activity, while the bulk structure of the phosphides was maintained during the course of reaction as revealed from the XRD patterns. [All rights reserved Elsevier].

CC A8230 Specific chemical reactions; reaction mechanisms; A8230V Homogeneous catalysis; A6845D Adsorption and desorption kinetics; evaporation and condensation; A7870D X-ray absorption and absorption edges (condensed matter); A8280 Chemical analysis and related physical methods of analysis

CT **CARBON; CATALYSTS; CHEMICAL ANALYSIS; CHEMISORPTION; EXAFS; MOLYBDENUM COMPOUNDS; NICKEL COMPOUNDS; PARTICLE SIZE; REDUCTION (CHEMICAL); TUNGSTEN COMPOUNDS; X-RAY DIFFRACTION**

ST **carbon black support; nickel metal phosphide; molybdenum metal phosphide; tungsten metal phosphide; temperature-programmed reduction; X-ray diffraction; elemental analysis; extended X-ray absorption fine structure; catalyst activity; hydrodesulfurization; hydrodenitrogenation; liquid feed; 4,6-dimethyldibenzothiophene; dimethyl disulfide; quinoline; chemisorption site; molar space velocity; silica; particle size; sulfur deposition; EXAFS; surface phosphosulfide phase formation; XRD; 613 K; 3.1 MPa; 110 h; Ni2P-C; MoP-C; WP-C**

CHI Ni2P-C int, Ni2P int, Ni2 int, Ni int, C int, P int, Ni2P bin, Ni2 bin, Ni bin, P bin, C el; MoP-C int, MoP int, Mo int, C int, P int, MoP bin, Mo bin, P bin, C el; WP-C int, WP int, C int, P int, W int, WP bin, P bin, W

bin, C el
PHP temperature 6.13E+02 K; pressure 3.1E+06 Pa; time 4.0E+05 s
ET Ni*P; Ni2P; Ni cp; cp; P cp; Mo*P; MoP; Mo cp; C*O; CO; C cp; O cp; Ni;
Mo*Ni*S; Mo sy 3; sy 3; Ni sy 3; S sy 3; Ni-Mo-S; Al*O; Al2O3; Al cp;
O*Si; SiO2; Si cp; P; C*Ni*P; Ni2P-C; C*Mo*P; MoP-C; C; Mo

L93 ANSWER 2 OF 14 INSPEC (C) 2005 IEE on STN
AN 2005:8451643 INSPEC DN A2005-14-8630G-038; B2005-07-8410G-056
TI Performance of polymer electrolyte membrane fuel cells with carbon
nanotubes as oxygen reduction catalyst
support material.
AU Ramaprabhu, S. (Dept. of Phys., Indian Inst. of Technol. Madras, Chennai,
India); Rajalakshmi, N.; Ryu, H.; Shaijumon, M.M.
SO Journal of Power Sources (2 Feb. 2005) vol.140, no.2, p.250-7. 29 refs.
Doc. No.: S0378-7753(04)00948-6
Published by: Elsevier
CODEN: JPSODZ ISSN: 0378-7753
SICI: 0378-7753(20050202)140:2L:250:PPEM;1-8

DT Journal
TC Experimental
CY Switzerland
LA English
AB **Platinum/carbon nanotubes (Pt/CNT) electrocatalysts**
are prepared. The CNTs are pre-treated in order to obtain reactive sites
for the adherence of Pt metal particles. The electrocatalysts
are characterized by scanning electron micrograph (SEM), transmission
electron micrograph (TEM) and X-ray photoelectron spectrum (XPS)
measurements. It is found that the catalysts contain both Pt(0)
and Pt(IV) species. A high Pt loading of 32.5% on CNTs
is obtained when the catalysts are prepared with ethylene glycol and
Pt salt. The electrocatalysts are used for the oxygen reduction
reaction in polymer electrolyte membrane fuel cells (PEMFCs) and the
performance of PEMFC is analyzed with respect to catalyst synthesis and
Pt loading. Cyclic voltammetric studies show that the Pt
utilization in the fuel-cell electrodes is around 44%. Catalysts obtained
with mild nitric acid-treated CNTs give a better performance of 680mV at
500mA cm-2 and 600mV at 800mA cm-2 than catalysts prepared with ethylene
glycol and Pt salt. [All rights reserved Elsevier].

CC A8630G Fuel cells; A8120V Preparation of fullerenes and fullerene-related
materials, intercalation compounds, and diamond; B8410G Fuel cells; B2230F
Fullerene, nanotube and related devices

CT **CARBON NANOTUBES; CATALYSTS; PLATINUM;**
PROTON EXCHANGE MEMBRANE FUEL CELLS; SCANNING ELECTRON MICROSCOPY;
TRANSMISSION ELECTRON MICROSCOPY; VOLTAMMETRY (CHEMICAL ANALYSIS); X-RAY
PHOTOELECTRON SPECTRA

ST polymer electrolyte membrane fuel cell; carbon nanotube; **oxygen**
reduction catalyst; support material; electrocatalyst; scanning
electron micrograph; SEM; transmission electron micrograph; TEM; X-ray
photoelectron spectrum measurement; XPS; PEMFC; cyclic voltammetric;
Pt

CHI Pt el
ET Pt

L93 ANSWER 3 OF 14 INSPEC (C) 2005 IEE on STN
AN 2004:8249580 INSPEC DN A2005-05-8630G-009; B2005-02-8410G-070
TI A solid-polymer electrolyte direct methanol fuel cell with a
methanol-tolerant cathode and its mathematical modelling.
AU Raman, R.K. (Solid State & Struct. Chem. Unit, Indian Inst. of Sci.,
Bangalore, India); Murgia, G.; Shukla, A.K.
SO Journal of Applied Electrochemistry (Oct. 2004) vol.34, no.10, p.1029-38.

- 34 refs.
Published by: Kluwer Academic Publishers
CODEN: JAELEBJ ISSN: 0021-891X
SICI: 0021-891X(200410)34:10L.1029:SPED;1-W
- DT Journal
TC Practical; Theoretical; Experimental
CY Netherlands
LA English
AB Solid-polymer electrolyte direct methanol fuel cells (SPE-DMFCs) employing **carbon-supported Pt-Fe as oxygen-reduction catalyst** to mitigate the effect of methanol on cathode performance while operating with oxygen or air have been assembled. These SPE-DMFCs provided maximum power densities of 250 and 120 mWcm⁻² at 85 degrees C on operating with oxygen and air, respectively. The polarization data for the SPE-DMFCs and their constituent electrodes have also been derived numerically employing a model based on phenomenological transport equations for the catalyst layer, diffusion layer and the membrane electrolyte.
- CC A8630G Fuel cells; A8245 Electrochemistry and electrophoresis; A0260 Numerical approximation and analysis; A0560 Transport processes: theory; B8410G Fuel cells; B0290 Numerical analysis
- CT **CARBON; CATALYSTS; DIFFUSION; ELECTROCHEMICAL ELECTRODES; FUEL CELLS; IRON; NUMERICAL ANALYSIS; ORGANIC COMPOUNDS; OXYGEN; PLATINUM COMPOUNDS; POLARISATION; POLYMER ELECTROLYTES; SOLID ELECTROLYTES**
- ST solid-polymer electrolyte; direct methanol fuel cell; methanol-tolerant cathode; mathematical modelling; carbon; **oxygen-reduction catalyst**; power density; polarization data; phenomenological transport equation; diffusion layer; numerical modelling; 85 degC; **Pt-Fe**; C
- CHI PtFe bin, Fe bin, Pt bin; C el
PHP temperature 3.58E+02 K
ET Fe*Pt; Fe sy 2; sy 2; Pt sy 2; Pt-Fe; C; PtFe; Pt cp; cp; Fe cp; Fe; Pt
- L93 ANSWER 4 OF 14 INSPEC (C) 2005 IEE on STN
AN 2004:8249202 INSPEC DN A2005-05-8265-005; B2005-02-8420-064
TI Oxygen reduction by sol derived [Co, N, C, O]-based **catalysts** for use in proton exchange membrane fuel cells.
- AU Sirk, A.H.C. (Dept. of Chem., Univ. of Calgary, Alta., Canada); Campbell, S.A.; Birss, V.I.
SO Electrochemical and Solid-State Letters (Feb. 2005) vol.8, no.2, p.A104-7. 20 refs.
Doc. No.: S1099-0062(05)01802-x
Published by: Electrochem. Soc
Price: CCCC 1099-0062/2005/8(2)/A104/4/\$7.00
CODEN: ESLEF6 ISSN: 1099-0062
SICI: 1099-0062(200502)8:2L.a104:ORDB;1-6
- DT Journal
TC Practical; Experimental
CY United States
LA English
AB Two Co oxide sol-derived catalysts, one based on ethylenediamine and one on 1,2-phenylenediamine, were synthesized and examined for their oxygen reduction reaction (ORR) behavior in 0.5 M H₂SO₄. **Supporting** the catalyst on **carbon** powder significantly improved the catalyst performance, while heat-treatment of the **carbon-supported** catalysts at 650-900 degrees C for 2 h under nitrogen dramatically improved its activity and selectivity. The ORR activity was further improved by increasing the concentration of the [Co, N, C, O]-based **catalyst** on

carbon powder to 4% (wt % Co/C), employing the more aromatic 1,2-phenylenediamine ligand, and by using a ligand to Co ratio of 2:1.

CC A8265J Heterogeneous catalysis at surfaces and other surface reactions; A8230 Specific chemical reactions; reaction mechanisms; A8140G Other heat and thermomechanical treatments; A8630G Fuel cells; A8270G Gels and sols; B8420 Solar cells and arrays

CT **CARBON; CATALYSTS; COBALT COMPOUNDS; HEAT TREATMENT; ORGANIC COMPOUNDS; OXYGEN; POWDERS; PROTON EXCHANGE MEMBRANE FUEL CELLS; REDUCTION (CHEMICAL); SOLS**

ST oxygen reduction reaction; **sol derived [Co, N, C, O]-based catalysts**; proton exchange membrane fuel cells; carbon powder; heat treatment; **carbon-supported catalysts**; more aromatic 1,2-phenylenediamine ligand; 650 to 900 degC; C

CHI C el

PHP temperature 9.23E+02 to 1.17E+03 K

ET N; C; O]; Co; H*O*S; H2SO4; H cp; cp; S cp; O cp

L93 ANSWER 5 OF 14 INSPEC (C) 2005 IEE on STN

AN 2004:8069024 INSPEC DN A2004-19-8630G-011; B2004-10-8410G-006

TI Effect of preparation conditions of Pt/C **catalysts** on **oxygen** electrode performance in proton exchange membrane fuel cells.

AU Tian, J.H.; Wang, F.B.; Shan, Zh.Q.; Wang, R.J.; Zhang, J.Y. (Sch. of Chem. Eng. & Technol., Tianjin Univ., China)

SO Journal of Applied Electrochemistry (May 2004) vol.34, no.5, p.461-7. 11 refs.
Published by: Kluwer Academic Publishers
CODEN: JAELEBJ ISSN: 0021-891X
SICI: 0021-891X(200405)34:5L:461:EPCC;1-S

DT Journal

TC Theoretical; Experimental

CY Netherlands

LA English

AB Supported Pt/C catalyst with 3.2 nm **platinum** crystallites was prepared by the impregnation-reduction method. The various preparation conditions, such as the reaction temperature, the concentration of precursor H2PtCl6 solution and the different reducing agents, and the relationship between the preparation conditions and the catalyst performance were studied. The **carbon black support** after heat treatment in N2 showed improved **platinum** dispersion. The particle size and the degree of dispersion of Pt on the **carbon black support** were observed by transmission electron microscopy (TEM). The crystal phase composition of Pt in the catalyst was determined by X-ray diffraction (XRD). The surface characteristics of the **carbon black support** and the Pt/C catalyst were studied by X-ray photoelectron spectroscopy (XPS). The electrochemical characteristics of the Pt/C catalysts were evaluated from current-voltage curves of the membrane electrode assembly (MEA) in a proton exchange membrane fuel cell.

CC A8630G Fuel cells; A8245 Electrochemistry and electrophoresis; A8230 Specific chemical reactions; reaction mechanisms; B8410G Fuel cells

CT **CARBON; CATALYSTS; ELECTROCHEMICAL ELECTRODES; NITROGEN; OXYGEN; PLATINUM; PROTON EXCHANGE MEMBRANE FUEL CELLS; REDUCTION (CHEMICAL); TRANSMISSION ELECTRON MICROSCOPES; X-RAY DIFFRACTION; X-RAY PHOTOELECTRON SPECTRA**

ST impregnation-reduction method; reaction temperature; reducing agent; catalyst performance; carbon black; heat treatment; **platinum dispersion**; particle size; transmission electron microscopy; TEM;

- crystal phase composition; X-ray diffraction; XRD; X-ray photoelectron spectroscopy; XPS; electrochemical characteristic; current-voltage curve; membrane electrode assembly; MEA; proton exchange membrane fuel cell; H₂PtCl₆; Pt-C; N₂
- CHI H₂PtCl₆ ss, Cl₆ ss, Cl ss, H₂ ss, Pt ss, H ss; PtC bin, Pt bin, C bin; N₂ el, N el
- ET Pt; Cl*H*Pt; H₂PtCl₆; H cp; cp; Pt cp; Cl cp; N₂; C*Pt; Pt-C; H₂PtCl; Cl; H; PtC; C cp; N
- L93 ANSWER 6 OF 14 INSPEC (C) 2005 IEE on STN
- AN 2004:8013310 INSPEC DN A2004-16-8230-014; B2004-08-8410G-045
- TI **Carbon-supported Pt-Fe alloy as a methanol-resistant oxygen-reduction catalyst for direct methanol fuel cells.**
- AU Shukla, A.K.; Raman, R.K.; Choudhury, N.A. (Solid State & Struct. Chem. Unit, Indian Inst. of Sci., Bangalore, India); Priolkar, K.R.; Sarode, P.R.; Emura, S.; Kumashiro, R.
- SO Journal of Electroanalytical Chemistry (1 March 2004) vol.563, no.2, p.181-90. 55 refs.
Published by: Elsevier
Price: CCCC 0022-0728/04/\$30.00
CODEN: JECHES ISSN: 0022-0728
SICI: 0022-0728(20040301)563:2L:181:CSAM;1-N
- DT Journal
- TC Bibliography; Experimental
- CY Switzerland
- LA English
- AB Crossover of methanol from the anode to the cathode through the polymer-electrolyte membrane in solid-polymer-electrolyte direct methanol fuel cells constitutes a significant loss in their performance. Pt/C and Pt-Fe/C electrocatalysts have been characterized by X-ray diffraction, and X-ray photoelectron and X-ray absorption spectroscopies in conjunction with electrochemistry. It is found that Pt-Fe/C alloy crystallizing in an ordered face centered tetragonal crystal structure with higher proportions of active-platinum sites and a completely different nearest neighbour environment than Pt/C exhibits significantly high oxygen-reduction activity in the presence of methanol while Pt/C shows a methanol poisoning effect under similar conditions.
- CC A8230V Homogeneous catalysis; A8630G Fuel cells; A8230 Specific chemical reactions; reaction mechanisms; A8245 Electrochemistry and electrophoresis; A6160 Crystal structure of specific inorganic compounds; B8410G Fuel cells
- CT **CARBON; CATALYSTS; CRYSTAL STRUCTURE; ELECTROCHEMISTRY; IRON ALLOYS; PLATINUM ALLOYS; PROTON EXCHANGE MEMBRANE FUEL CELLS; REDUCTION (CHEMICAL); X-RAY ABSORPTION SPECTRA; X-RAY DIFFRACTION; X-RAY PHOTOELECTRON SPECTRA**
- ST **Carbon supported PtFe alloy; oxygen reduction catalyst** ; direct methanol fuel cells; solid polymer electrolyte fuel cells; **Pt/C electrocatalysts**; PtFe/C electrocatalysts; X-ray diffraction; X-ray photoelectron spectroscopy; X-ray absorption spectroscopy; electrochemistry; face centered tetragonal crystal structure; **active platinum sites**; methanol poisoning effect; PtFe-C
- CHI PtFeC ss, Fe ss, Pt ss, C ss
- ET Fe*Pt; Fe sy 2; sy 2; Pt sy 2; Pt-Fe; Pt; PtFe; Pt cp; cp; Fe cp; C*Fe*Pt; C sy 3; sy 3; Fe sy 3; Pt sy 3; PtFe-C; PtFeC; C cp; Fe
- L93 ANSWER 7 OF 14 INSPEC (C) 2005 IEE on STN
- AN 2004:7849462 INSPEC DN A2004-05-8120G-032; B2004-03-8410G-016
- TI Formation, microstructural characteristics and stability of **carbon**

- supported platinum** catalysts for low temperature fuel cells.
- AU Antolini, E. (Scuola di Sci. di Materiali, Genoa, Italy)
SO Journal of Materials Science (15 July 2003) vol.38, no.14, p.2995-3005. 85 refs.
Published by: Kluwer Academic Publishers
CODEN: JMTSAS ISSN: 0022-2461
SICI: 0022-2461(20030715)38:14L.2995:FMCS;1-U
- DT Journal
TC General Review; Experimental
CY United States
LA English
AB Supported **platinum** electrocatalysts are generally used in low temperature fuel cells to enhance the rates of the hydrogen oxidation and **oxygen** reduction reactions. In such **catalysts**, the high surface to volume ratios of the **platinum** particles maximize the area of the surfaces available for reaction. It is the structure and proper dispersal of these **platinum** particles that make low-loading catalysts feasible for fuel cell operation, lowering the cost of the system. If the **platinum** particles cannot maintain their structure over the lifetime of the fuel cell, change in the morphology of the catalyst layer from the initial state will result in a loss of electrochemical activity. This loss of activity in the **platinum** /carbon catalysts due to the agglomeration of **platinum** particles is considered to be a major cause of the decrease in cell performance, especially in the case of the cathode. In the light of the latest advances on this field, this paper reviews the preparation methods of these catalysts, their microstructural characteristic and their effect on both thermal and in cell conditions stability.
- CC A8120G Preparation of metals and alloys (compacts, pseudoalloys); A8630G Fuel cells; A8245 Electrochemistry and electrophoresis; A8230 Specific chemical reactions; reaction mechanisms; A0130R Reviews and tutorial papers; resource letters; A8265J Heterogeneous catalysis at surfaces and other surface reactions; A6150J Crystal morphology and orientation; B8410G Fuel cells; B0530 Metals and alloys (engineering materials science)
- CT **CARBON; CATALYSTS; CRYSTAL MORPHOLOGY; ELECTROCHEMISTRY; FUEL CELLS; MATERIALS PREPARATION; OXIDATION; PARTICLE SIZE; PLATINUM; REDUCTION (CHEMICAL); REVIEWS; SURFACE CHEMISTRY; THERMAL STABILITY**
- ST microstructural analysis; **carbon supported platinum catalysts stability**; low temperature fuel cells; **platinum electrocatalysts**; hydrogen oxidation reactions rate; oxygen reduction reactions rate; surface-volume ratios; **platinum particles structure**; surfaces area; fuel cell life time; catalyst layer morphology; electrochemical activity loss; **platinum/carbon catalysts**; agglomeration; cathode; reviews; thermal effect; **Pt-C**
- CHI PtC sur, Pt sur, C sur, PtC ss, Pt ss, C ss
ET C*Pt; Pt-C; PtC; Pt cp; cp; C cp; Pt; C
- L93 ANSWER 8 OF 14 INSPEC (C) 2005 IEE on STN
AN 2004:7833267 INSPEC DN A2004-04-8120V-008
TI Synthesis of carbon nanostructures on **nanocrystalline Ni** -Ni3P catalyst **supported** by SiC whiskers.
- AU Dongyan Ding; Jiannong Wang; Zongliang Cao; Jiehua Dai (Sch. of Mater. Sci. & Eng., Shanghai Jiao Tong Univ., China)
SO Carbon (2003) vol.41, no.3, p.579-82. 19 refs.
Doc. No.: S0008-6223(02)00339-1
Published by: Elsevier
Price: CCCC 0008-6223/02/\$30.00

CODEN: CRBNAH ISSN: 0008-6223
SICI: 0008-6223(2003)41:3L:579:SCNN;1-5

DT Journal
TC Experimental
CY United Kingdom
LA English
AB In this paper, we report another way to grow carbon nanotubes and several kinds of special carbon nanostructures, through the pyrolysis of the acetylene on a nanocrystalline Ni-P (Ni-Ni3P) catalyst deposited on the surface of SiC whiskers.

CC A8120V Preparation of fullerenes and fullerene-related materials, intercalation compounds, and diamond; A6150C Physics of crystal growth; A8265J Heterogeneous catalysis at surfaces and other surface reactions; A8230L Decomposition reactions (pyrolysis, dissociation, and group ejection)

CT CARBON NANOTUBES; CATALYSTS; CRYSTAL GROWTH; NICKEL; NICKEL COMPOUNDS; PYROLYSIS; SILICON COMPOUNDS; WHISKERS (CRYSTAL)

ST carbon nanostructures; nanocrystalline catalyst; SiC whiskers; carbon nanotube growth; pyrolysis; acetylene; C; Ni-NiP; SiC

CHI C el; Ni-NiP int, NiP int, Ni int, P int, NiP bin, Ni bin, P bin, Ni el; SiC bin, Si bin, C bin

ET Ni*P; Ni sy 2; sy 2; P sy 2; Ni3P; Ni cp; cp; P cp; Ni-Ni3P; C*Si; SiC; Si cp; C cp; In; Ni-P; C; NiP; Ni-NiP; Ni; P; Si

L93 ANSWER 9 OF 14 INSPEC (C) 2005 IEE on STN
AN 2003:7558079 INSPEC DN A2003-08-8245-035
TI Fabrication and evaluation of platinum/diamond composite electrodes for electrocatalysis.
AU Jian Wang; Swain, G.M. (Dept. of Chem., Michigan State Univ., East Lansing, MI, USA)
SO Journal of the Electrochemical Society (Jan. 2003) vol.150, no.1, p.E24-32. 46 refs.
Doc. No.: S0013-4651(03)02801-5
Published by: Electrochem. Soc
Price: CCCC 0013-4651/2003/150(1)/E24/9/\$7.00
CODEN: JESOAN ISSN: 0013-4651
SICI: 0013-4651(200301)150:1L:E24:FEPD;1-L

DT Journal
TC Experimental
CY United States
LA English
AB A catalytic electrode was prepared using a new electrically conducting and corrosion resistant carbon support material, boron-doped diamond. Fabrication of the composite electrode involves a three-step process: (i) continuous diamond thin-film deposition on a substrate, (ii) electrodeposition of Pt catalyst particles on the diamond surface, and (iii) short-term diamond deposition to entrap the metal particles into the surface microstructure. The process results in a conductive, morphologically, and microstructurally stable composite electrode containing metal particles of somewhat controlled composition, size, and catalytic activity. The metal catalyst particles were galvanostatically deposited from a K2PtCl6/HClO4 solution, with the metal particle size (50-350 nm) and distribution (109 cm⁻²) being controlled by adjusting the galvanostatic deposition and secondary diamond-growth conditions. For a 300 s Pt deposition time, the estimated loading was 75.8 $\mu\text{g}/\text{cm}^2$, assuming a 100% current efficiency. The composite electrode was extremely stable, both structurally and catalytically, during a 2 h polarization in 85% H3PO4 at 170 degrees C and 0.1 A/cm². The electrode's catalytic activity was

evaluated using the O₂ reduction reaction at room temperature in 0.1 M solutions of H₃PO₄, H₂SO₄, and HClO₄. The kinetic parameters (Tafel slope and exchange current density) were obtained by cyclic voltammetry and were found to be comparable to those for a polycrystalline Pt electrode in the same media. Tafel slopes of -63 to -80 mV/dec were observed at low overpotentials, with the lowest slope in HClO₄ and highest in H₃PO₄. The exchange current density ranged from 10⁻¹² to 10⁻¹⁰ A/cm², and increased in the order of H₃PO₄<H₂SO₄<HClO₄. The potential advantages of the composite electrode, as compared with commercial sp² carbon electrodes, are (i) the corrosion resistance of the diamond support, resulting in highly stable reaction centers at high potentials, current densities, and temperatures, and (ii) the fact that all of the catalyst particles are strongly anchored at the film surface and are not contained inside pores.

CC A8245 Electrochemistry and electrophoresis; A8265J Heterogeneous catalysis at surfaces and other surface reactions; A8115L Deposition from liquid phases (melts and solutions)

CT CATALYSTS; DIAMOND; ELECTROCHEMICAL ELECTRODES; ELECTRODEPOSITION; OXYGEN; PLATINUM; REDUCTION (CHEMICAL)

ST platinum/diamond composite electrode; electrocatalysis; boron doped diamond; carbon support material; diamond thin film deposition; Pt catalyst particles; surface microstructure; galvanostatic deposition; electrodeposition; kinetic parameters; Tafel slope; exchange current density; cyclic voltammetry; corrosion resistance; oxygen reduction reaction; electrically conducting material; particle size distribution; secondary diamond growth; catalytic activity; 170 degC; C:B-Pt; O₂

CHI C:BPT ss, BPT ss, Pt ss, B ss, C ss, C el, BPT dop, Pt dop, B dop; O₂ el, O el

PHP temperature 4.43E+02 K

ET Pt; Cl*H*K*O*Pt; Cl sy 5; sy 5; H sy 5; K sy 5; O sy 5; Pt sy 5; K2PtCl6/HClO₄; K cp; cp; Pt cp; Cl cp; H cp; O cp; H*O*P; H₃PO₄; P cp; C; O₂; H*O*S; H₂SO₄; S cp; Cl*H*O; HClO₄; C*B*Pt; B doping; doped materials; C:B-Pt; C:BPT; BPT doping; B*Pt; BPT; B cp; O

L93 ANSWER 10 OF 14 INSPEC (C) 2005 IEE on STN

AN 2002:7476044 INSPEC DN A2003-02-8245-006

TI Investigation of the electrochemical behavior of heat-treated carbon blacks and Pt/C catalysts.

AU Huang, C.D.; Xiong, Z.T.; Lin, J.Y.; Tan, K.L. (Dept. of Phys., Nat. Univ. of Singapore, Singapore)

SO Surface Review and Letters (June-Aug. 2002) vol.9, no.3-4, p.1443-52. 20 refs.

Published by: World Scientific

CODEN: SRLEFH ISSN: 0218-625X

SICI: 0218-625X(200206/08)9:3/4L:1443:IEBH;1-9

DT Journal

TC Experimental

CY Singapore

LA English

AB In this paper we report the electrochemical behavior of heat-treated carbon blacks and Pt/C catalysts. Cyclic voltammetry indicates that the heat-treated carbon black as catalyst support does not improve the Pt/C catalyst activity for methanol oxidation. An XPS study of a Pt-loaded carbon black indicates that the amounts of oxidized platinum and oxygen -functional groups on catalysts are decreased when the platinum particles are deposited on the heat-treated carbon surface. These changes in the surface and crystalline structural properties of carbon materials lead to the catalytic activity change in

methanol electro-oxidation.

CC A8245 Electrochemistry and electrophoresis; A7960G Photoelectron spectra of composite surfaces; A8140G Other heat and thermomechanical treatments; A8265J Heterogeneous catalysis at surfaces and other surface reactions; A8280F Electrochemical analytical methods

CT **CARBON**; **CATALYSTS**; ELECTROCHEMISTRY; HEAT TREATMENT; OXIDATION; **PLATINUM**; SURFACE CHEMISTRY; VOLTAMMETRY (CHEMICAL ANALYSIS); X-RAY PHOTOELECTRON SPECTRA

ST electrochemical behavior; heat treatment; **Pt/C catalysts**; cyclic voltammetry; **carbon black catalyst support**; catalyst activity; methanol electro-oxidation; XPS study; **Pt-loaded carbon black**; C surface; surface properties; crystalline structure; C; **Pt**

CHI C sur, C el; Pt sur, Pt el

ET Pt; In; C

L93 ANSWER 11 OF 14 INSPEC (C) 2005 IEE on STN

AN 2001:6973577 INSPEC DN A2001-16-8630G-001; B2001-08-8410G-026

TI **Platinum**-based alloys as **oxygen**-reduction **catalysts** for solid-polymer-electrolyte direct methanol fuel cells.

AU Neergat, M.; Shukla, A.K. (Solid State & Structural Chem. Unit, Indian Inst. of Sci., Bangalore, India); Gandhi, K.S.

SO Journal of Applied Electrochemistry (April 2001) vol.31, no.4, p.373-8. 36 refs.
Published by: Kluwer Academic Publishers
Price: CCCC 0021-891X/2001/\$19.50
CODEN: JAELEBJ ISSN: 0021-891X
SICI: 0021-891X(200104)31:4L:373:PBAO;1-F

DT Journal

TC Experimental

CY Netherlands

LA English

AB Electrocatalytic activities of various **carbon-supported platinum**-based binary, namely, **Pt-Co/C**, **Pt-Cr/C** and **Pt-Ni/C**, and ternary, namely, **Pt-Co-Cr/C** and **Pt-Co-Ni/C**, alloy **catalysts** towards **oxygen** reduction in solid-polymer-electrolyte direct methanol fuel cells were investigated at 70 degrees C and 90 degrees C both at ambient and 2 bar oxygen pressures. It was found that **Pt-Co/C** exhibits superior activity relative to **Pt/C** and other alloy catalysts.

CC A8630G Fuel cells; A8245 Electrochemistry and electrophoresis; A6630H Self-diffusion and ionic conduction in solid nonmetals; A8265J Heterogeneous catalysis at surfaces and other surface reactions; B8410G Fuel cells

CT **CARBON**; CATALYSIS; **CATALYSTS**; ELECTROCHEMISTRY; OXYGEN; **PLATINUM** ALLOYS; POLYMER ELECTROLYTES; PROTON EXCHANGE MEMBRANE FUEL CELLS; REDUCTION (CHEMICAL); SOLID ELECTROLYTES

ST solid-polymer-electrolyte direct methanol fuel cells; **oxygen-reduction catalysts**; electrocatalytic activities; **carbon-supported platinum alloy catalysts**; catalytic activity; 70 C; 90 C; 1 bar; 2 bar; PtCo-C; PtCr-C; PtNi-C; PtCoCr-C; PtCoNi-C

CHI PtCoC ss, Co ss, Pt ss, C ss; PtCrC ss, Cr ss, Pt ss, C ss; PtNiC ss, Ni ss, Pt ss, C ss; PtCoCrC ss, Co ss, Cr ss, Pt ss, C ss; PtCoNiC ss, Co ss, Ni ss, Pt ss, C ss

PHP temperature 3.43E+02 K; temperature 3.63E+02 K; pressure 1.0E+05 Pa; pressure 2.0E+05 Pa

ET Co*Pt; Co sy 2; sy 2; Pt sy 2; Pt-Co; Cr*Pt; Cr sy 2; Pt-Cr; Ni*Pt; Ni sy 2; Pt-Ni; Co*Cr*Pt; Co sy 3; sy 3; Cr sy 3; Pt sy 3; Pt-Co-Cr; Co*Ni*Pt; Ni sy 3; Pt-Co-Ni; C; Pt; C*Co*Pt; C sy 3; PtCo; Pt cp; cp; Co cp; PtCo-C;

C*Cr*Pt; PtCr; Cr cp; PtCr-C; C*Ni*Pt; PtNi; Ni cp; PtNi-C; C*Co*Cr*Pt; C sy 4; sy 4; Co sy 4; Cr sy 4; Pt sy 4; PtCoCr; PtCoCr-C; C*Co*Ni*Pt; Ni sy 4; PtCoNi; PtCoNi-C; PtCoC; C cp; Co; PtCrC; Cr; PtNiC; Ni; PtCoCrC; PtCoNiC

- L93 ANSWER 12 OF 14 INSPEC (C) 2005 IEE on STN
AN 1999:6331074 INSPEC DN A1999-19-8630G-016; B1999-10-8410G-019
TI **Carbon supported ternary platinum alloys as oxygen reduction catalysts** for proton exchange membrane fuel cells.
AU Gamburzev, S.; Velez, O.A.; Srinivasan, S.; Appleby, A.J. (Center for Electrochem. Syst. & Hydrogen Res., Texas A&M Univ., College Station, TX, USA); Luczak, F.; Wheeler, D.
SO Symposium on Electrode Materials and Processes for Energy Conversion and Storage IV
Editor(s): McBreen, J.; Mukerjee, S.; Srinivasan, S.
Pennington, NJ, USA: Electrochemical Society Inc, 1997. p.78-85 of viii+370 pp. 6 refs.
Conference: Montreal, Que., Canada, 4-9 May 1997
DT Conference Article
TC Experimental
CY United States
LA English
AB Ternary **platinum-cobalt-chromium** alloys **supported** on graphitized **carbon** black with different **platinum** weight ratios as an oxygen reduction electrocatalyst in PEMFC were studied. The physical characterization of these electrocatalysts shows the presence of alloy as a separate crystal phase. The electrochemical activity of alloy electrocatalysts was determined in both phosphoric acid and proton exchange membrane fuel cells. In the last case, a sufficient enhancement of the activity of **platinum** alloy electrocatalyst compared with pure **platinum** was founded. The long term test of hydrogen-air PEMFC with **platinum** alloy catalyst shows a good stability of performance during 500 hours of operation. The use of these alloys as a promising electrocatalyst in PEMFCs for a portable power and electric vehicle application will show promise for achieving the energy and power densities.
CC A8630G Fuel cells; A8265J Heterogeneous catalysis at surfaces and other surface reactions; A8245 Electrochemistry and electrophoresis; B8410G Fuel cells
CT **CARBON**; **CATALYSIS**; **CATALYSTS**; **CHROMIUM ALLOYS**; **COBALT ALLOYS**; **ELECTROCHEMISTRY**; **PLATINUM ALLOYS**; **PROTON EXCHANGE MEMBRANE FUEL CELLS**; **REDUCTION (CHEMICAL)**
ST proton exchange membrane fuel cells; **oxygen reduction catalysts**; **carbon-supported ternary platinum alloys**; **platinum weight ratio**; physical characterization; electrochemical activity; alloy electrocatalysts; activity improvement; long-term testing; electrochemical performance stability; portable power; electric vehicles; applications; energy densities; power densities; 500 h; PtCoCr-C; H₂-O₂
CHI PtCoCrC ss, Co ss, Cr ss, Pt ss, C ss; H₂-O₂ int, H₂ int, O₂ int, H int, O int, H₂ el, O₂ el, H el, O el
PHP time 1.8E+06 s
ET C*Co*Cr*Pt; C sy 4; sy 4; Co sy 4; Cr sy 4; Pt sy 4; PtCoCr; Pt cp; cp; Co cp; Cr cp; PtCoCr-C; H*O; H₂-O₂; PtCoCrC; C cp; Co; Cr; Pt; H; O
L93 ANSWER 13 OF 14 INSPEC (C) 2005 IEE on STN
AN 1998:5855074 INSPEC DN A9808-8630G-046; B9804-8410G-081
TI Efficient **Pt** catalysts for polymer electrolyte fuel cells.
AU Fournier, J.; Faubert, G.; Tilquin, J.Y.; Cote, R.; Guay, D.; Dodelet, J.P. (INRS-Energie, Varennes, Que., Canada)

SO FUEL CELL. 1996 Fuel Cell Seminar. Program and Abstracts
Washington, DC, USA: Courtesy Associates, 1996. p.595-8 of xxvi+794 pp. 7
refs. Availability: Annmarie Pittman, Courtesy Associates Inc, 655 15th
Street NW, Suite 300, Washington, DC 20005, USA
Conference: Orlando, FL, USA, 17-20 Nov 1996
Sponsor(s): Fuel Cell Organ. Comm

DT Conference Article
TC Experimental
CY United States
LA English

AB Commercialization of polymer electrolyte fuel cells (PEFCs) requires a
decrease in their production cost. Cost reduction for the electrodes
principally concerns the decrease in the amount of Pt catalyst
necessary for the functioning of the PEFC without affecting cell
performance. The lowest loadings reported for oxygen reduction are of the
order of 0.05 mg Pt/cm². The **carbon support**
of commercial catalysts is Vulcan XC-72 from Cabot a carbon black with a
specific area of 254 m²/g. Graphites with specific areas ranging from 20
to 305 m²/g are available from Lonza. The first aim of the present study
was to determine the catalytic properties for O₂ reduction of Pt
supported on these high specific area graphites. The second aim was to use
Pt inclusion synthesis on these high area graphites, and to
measure the catalytic performances of these materials. Lastly, this same
Pt-inclusion synthesis was extended even for use with Vulcan and
Black Pearls as substrates (two carbon blacks from Cabot). All these
catalysts have been labelled Pt-included materials to
distinguish them from the Pt-supported ones. It is shown that
the reduced Pt content Pt-included materials obtained
with high specific area substrates are excellent **catalysts** for
oxygen reduction, especially at high currents. Therefore,
Pt inclusion synthesis appears to be a new method to decrease the
cathodic Pt loading.

CC A8630G Fuel cells; A8265J Heterogeneous catalysis at surfaces and other
surface reactions; A8245 Electrochemistry and electrophoresis; B8410G Fuel
cells

CT **CATALYSTS; ELECTROCHEMICAL ELECTRODES; ELECTROLYTES; FUEL CELLS;**
GRAPHITE; PLATINUM; POLYMERS; SUBSTRATES

ST **Pt catalysts;** polymer electrolyte fuel cells; production cost
reduction; electrodes cost reduction; oxygen reduction; commercial
catalysts; Vulcan XC-72; Cabot; carbon black; Lonza; graphites; catalytic
properties; O₂ reduction; **Pt inclusion synthesis;** Black Pearls;
substrates; **cathodic Pt loading reduction;** Pt; O₂; C

CHI Pt el; O₂ el, O el; C sur, C el
ET Pt; O₂; C; O

L93 ANSWER 14 OF 14 INSPEC (C) 2005 IEE on STN
AN 1988:3078582 INSPEC DN A88028431; B88017923
TI Evaluation studies on **carbon supported**
catalysts for **oxygen** reduction in alkaline medium.

AU Srinivasan, V.S.; Singer, J. (Dept. of Chem., Bowling Green State Univ.,
OH, USA)

SO Proceedings of the 32nd International Power Sources Symposium
Pennington, NJ, USA: Electrochem. Soc, 1986. p.580-9 of xi+718 pp. 13
refs.
Conference: Cherry Hill, NJ, USA, 9-12 June 1986
Sponsor(s): US Army Lab. Command; Harry Diamond Labs.; LABCOM; et al

DT Conference Article
TC Experimental
CY United States
LA English

AB In view of the need for reliable long life alkaline fuel cells, especially for space power applications, tests are desired which can predict performance of fuel cell electrodes. In this work the electrode studied was the cathode of the alkaline oxygen fuel cell. The basic approaches for obtaining such information could be based on the techniques of cyclic voltammetry, polarization and current interruption. The first two techniques were employed to obtain information about the electrodes. The electrodes investigated were specially fabricated porous carbon electrodes with various amounts of dispersed **platinum** or gold as active catalysts. Unsupported gold **platinum** alloy was also examined. In alkaline fuel cells the carbon plays an important role in electron transfer reactions. Carbons were employed that had been treated in different ways. Correlation which might predict fuel cell performance was sought between the cyclic voltammetric data and the polarization data.

CC A8245 Electrochemistry and electrophoresis; A8265J Heterogeneous catalysis at surfaces and other surface reactions; A8630G Fuel cells; B8410G Fuel cells

CT **CARBON; CATALYSTS; ELECTROCHEMICAL ELECTRODES; FUEL CELLS; GOLD; PLATINUM**

ST electrode performance; alkaline medium; fuel cells; space power applications; cyclic voltammetry; polarization; electron transfer reactions; **Au-Pt**; porous C-Au electrodes; O₂ reduction; **porous C-Pt electrodes**

CHI AuPt bin, Au bin, Pt bin; CAu bin, Au bin, C bin; O₂ el, O el; CPt bin, Pt bin, C bin

ET In; Au*Pt; Au sy 2; sy 2; Pt sy 2; Au-Pt; C*Au; C-Au; O₂; C*Pt; C-Pt; AuPt; Au cp; cp; Pt cp; Au; Pt; CAu; C cp; O; CPt

=>